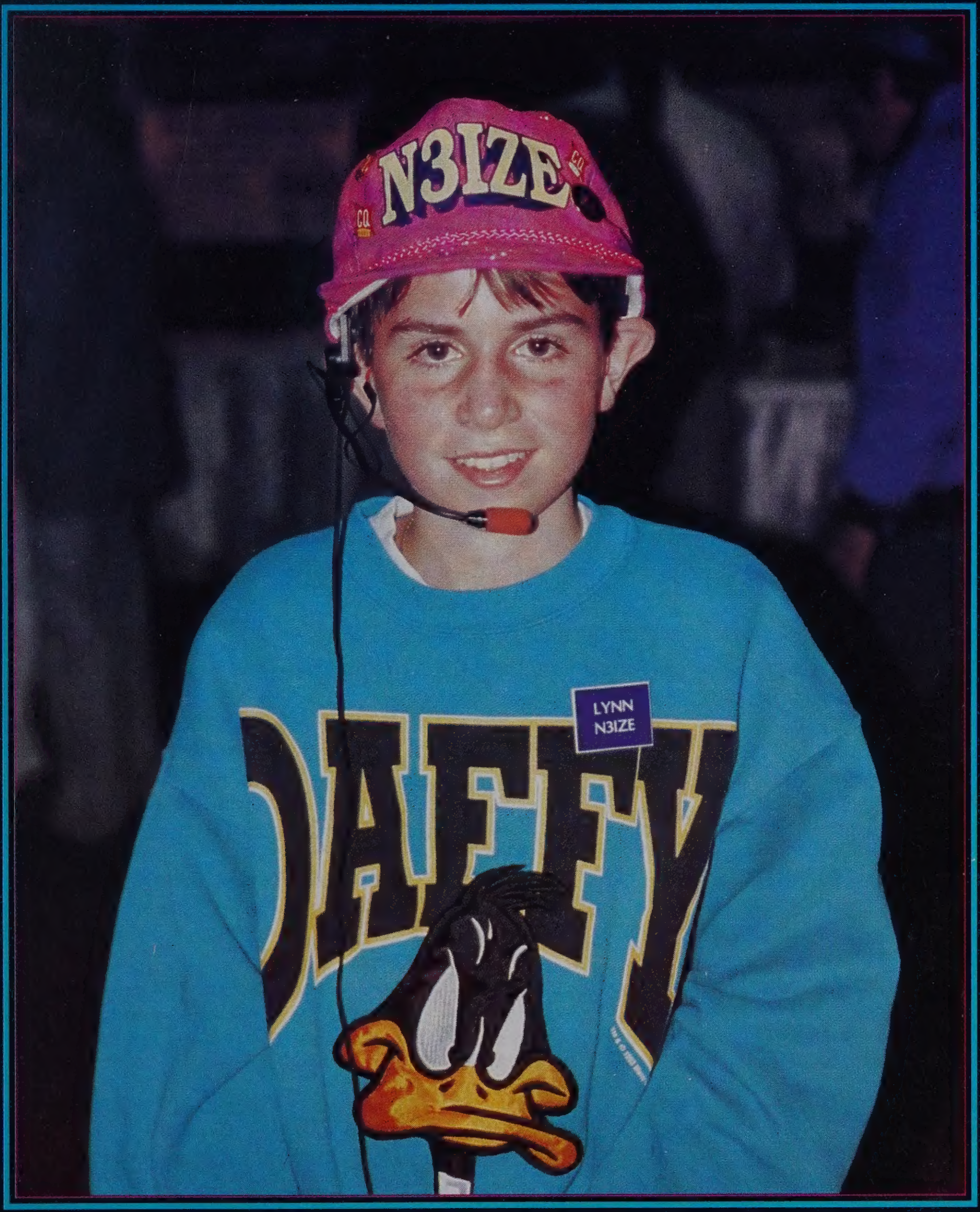
$2.00 US

The Amateur Radio
COMMUNICATOR

JULY/AUGUST 1994 FOR THE NOVICE AND TECHNICIAN AMATEUR Volume 4 Number 4

- ***NARA Reviews the Comet GP-9 VHF/UHF Vertical Antenna***
- ***How To Understand Digital Communications***
- ***How To Understand Propagation***
- ***NARA Reviews the Cushcraft A270-10S Beam***
- ***How To Increase Your VHF Range***



Give Technicians HF Access!

Give Technicians HF Access!

Give Technicians HF Access!

NONPROFIT ORG.
U.S. POSTAGE PAID
DALLAS, TX
PERMIT NO. 4258

CHANGE OF ADDRESS REQUESTED

DEMAND THE BEST

DR-600T (144 MHz/440 MHz)

The outstanding abilities of the DR-600T set it apart from every other radio. Features like Wide Frequency Coverage, Excellent Intermod Rejection, Direct Frequency Entry from the microphone, Three Output Power Selections, Autopatch Memories, and 6 Scanning Modes make the DR-600T the radio of choice for demanding users. The Remote Mount Head allows for custom installation in most any vehicle, and also helps to deter theft.

This road-ready rig can also be remote controlled by any radio that transmits DTMF tones. This remarkable feature allows the DR-600T to act as a full-featured Cross-Band Repeater. For added control, a security code can be programmed that will allow control only by the control operator (you).

DJ-G1T

The DJ-G1T 2m HI from ALINCO scores another "First" for Amateur Radio technology. Our new "Channel Scope" feature opens new doors for Ham operators. Now it is possible to visually monitor up to 7 memory channels at once with just a glance at the display.

Also, the Channel Scope feature can be used to show band activity in the frequency domain, much like a Digital Spectrum Analyzer. Hunting for band activity just got easier.

Other outstanding features include 440 Receive, 80 Memory channels, AM Aircraft receive, 5 Autodialer channels, DSQ for private paging, Cross-Band Semi-Duplex, 6 Scan Modes, and Odd Splits on all Memory Channels.

Better Products, Better Service.
See for yourself why people are coming to ALINCO.

ALINCO ELECTRONICS INC.

438 Amapola Ave., #130,
Torrance, CA 90501
Phone: (310) 618-8616
Fax: (310) 618-8758

— Other Great Products from ALINCO —

CONTENTS

FEATURES

6 How To Increase Your VHF Signal
by Donald L. Stoner
NARA Reviews the Comet GP-9 VHF/UHF Vertical Antenna

8 Ham Radio News You Can Use
by Bill Pasternak, WA6ITF
The Washington Newsline

10 NuMorse For Windows
by NARA Staff
New Code Practice Program Proves To Be A Hit At The 1994 Dayton "Hamvention"

12 What Do You Think?
Another View of Closed Repeaters

23 Is This The Radio Of The Future?
by NARA Staff
ComFocus Corporation Introduces A Digital Communications Receiver

26 How To Increase Your VHF Range
by Dave Ingram, K4TWJ
Big Ducks For Li'l Pups

DEPARTMENTS

2 In My Opinion
by Don Stoner, W6TNS
Editorial

4 How To Inspire Young People
by Carole Perry, WB2MGP
Never Too Old To Learn

14 How To Understand Digital
by Jerry Marsh, AA7UF
Digital Basics

18 How To Understand Propagation
by D•I•Y Radio/Kurt Feldmesser
We Are Entering the Sunspot Low—What Does It Mean For You?

22 How To "Soup Up" Your Handheld Radio
by NARA Staff
NARA Reviews the Cushcraft A270-10S Beam and Grants Award of Amateur Radio Excellence

28 Letters

ON THE COVER

The Amateur Radio
COMMUNICATOR
Give Technicians HF Access!
Give Technicians HF Access!
Give Technicians HF Access!

We immediately noticed that very special "light" in the eyes of Lynn Hummel, N3IZE, when he stopped by our booth at the 1994 Dayton Hamvention. It reflects the excitement of young people everywhere, who discover the wonders of ham radio. Lynn is 14 but got his first ticket at 11 and passed his General at age 12. He has assisted others in getting into ham radio and was a speaker at the 1992 Dayton Youth Forum. Lynn also plays saxophone and violin. His proud parents are Richard, N3IYZ, and Rebecca, N3IZA.

The Amateur Radio Communicator

The Amateur Radio Communicator is published bi-monthly and is the official journal of the National Amateur Radio Association (NARA), P.O. Box 201407, Arlington, TX 76006.

The National Amateur Radio Association is incorporated in the State of Washington and is a non-profit organization as defined in Section 501(c)(3) of the Internal Revenue Service Code.

Organization Goals

The broad goal of NARA is to publicize Amateur Radio and to encourage people to become Amateurs by earning an entry level Novice or Technician Class license.

The organization has five specific goals within this broad framework. These are to a)publicize Amateur Radio to the general public, b)attract young people to the Amateur Radio Service, c)increase the stature and benefits of the Novice and Technician Class licenses, d)represent the interests of Novice and Technician Class Amateurs at the national level and 5)make all Amateurs aware that our radio frequencies are in jeopardy from commercial interests. More specifically:

A. NARA advertises in consumer publications to create public awareness of the Amateur Radio Service.

B. NARA is interested in encouraging young people to join our fraternity. A core of young people insures growth of the Amateur Radio Service.

C. NARA believes that the Novice and Technician classes are important and respected entry level licenses into the Amateur Radio fraternity. We are committed to increasing their benefits and stature in the Amateur Radio community.

D. NARA is committed to representing the interests of all Novice and Technician Class Amateurs at the national level.

E. Finally, NARA is very concerned that confiscation of frequencies assigned to the Amateur Radio Service will continue. NARA is committed to obtaining new spectrum for the continued growth in numbers of Novice and Technician Class Amateurs.

Membership and Subscriptions

Those joining NARA receive a subscription to *The Amateur Radio Communicator* for one year. The combined cost of membership and magazine is $10.00 per year in all areas with a U.S. zip code. The NARA membership and subscription to *The Amateur Radio Communicator* cannot be separated.

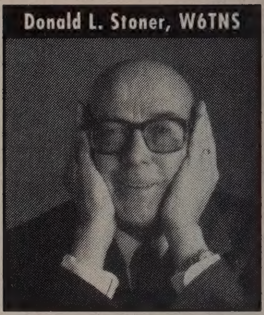
It is not necessary to hold an Amateur Radio license to become a member of the National Amateur Radio Association. The only "qualification" is an interest in radio communications.

How To Contact NARA

National Amateur Radio Association
P.O. Box 201407
Arlington, TX 76006
Inquiries..............................(817)860-0978
Orders Only..............1(800)GOT-2HAM
1(800)468-2426
FAX...................................(817)860-0979
MCI Mailbox...............................365-8035
CompuServe.............................70371,111
Advertising........................(817)860-0978

Editor/Publisher........Donald L. Stoner, W6TNS
General Manager.............Joe Condron, AA5LD
Marketing..............................George Ure, AC7X
Technical Editor.............Terry Dettmann, WX7S
VHF Editor......................Gordon West, WB6NOA
Technical Advisor...............Dan Lewis, N7NQL
Programming...................Olan Hanley, KB7GIS
Publication.................Deb Davis Bundy, N7IHY
Finance.......................................Lucy Heenan
Advertising.......................Joe Condron, AA5LD

NARA
NATIONAL AMATEUR RADIO ASSOCIATION
P.O. Box 201407
Arlington, TX 76006


Donald L. Stoner, W6TNS

Give No-Coders Access to HF

by Don Stoner, W6TNS

ANYONE WHO reads a ham publication knows that Technicians, the so-called "no-coders," are the fastest-growing segment of the Amateur Radio fraternity. More than 110,000 people have become Technician Class Amateurs since the introduction of the no-code license structure in February 1991. Sometime within the next few years there will be more Technicians than any other license class.

This is great for organizations such as the National Amateur Radio Association. Many newcomers want to bond with others who have similar interests. As a result, our membership has been growing by "leaps and bounds." **NARA is the only national organization devoted exclusively to the interests of the Novice and Technician Class Amateur.**

One purpose of the code-free Technician Class license was to increase the ranks of Amateur Radio. With 110,000 new members, it has certainly achieved this. Another purpose was to increase the population of the very high frequency portion of the radio spectrum to help protect our allocations. It has also accomplished this goal admirably, but I have some concerns—maybe we've done too good a job!

Certainly VHF operation satisfies the needs and desires of many newcomers. However, the incessant marchtoward the VHF portion of the spectrum may not be good for our fraternity. As I have said many times before, strapping a handheld onto your belt or clipping a rubber duck to your visor is not the ultimate experience in Amateur Radio. The wonders of high-frequency propagation, and all that it implies is the heart and soul of ham radio. HF is our Valhalla.

▼

In my opinion, we should permit all Technician Class Amateurs access to the high frequency spectrum!

In my opinion, we should permit all Technician Class Amateurs access to the high frequency spectrum! That group of objects up by the planet Jupiter, is not another "string of pearls" comet. It is thousands of hams who have just gone ballistic at the thought of giving the no-coders any more privileges. Upon return from their interplanetary travels, they can be expected to dip their torches in kerosene and march in unison over the causeway to Clearwater Beach looking for a handsome, bald-headed, and personable oracle. But before the tar assumes a liquid state and hundreds of feather pillows are destroyed, hear me out.

Currently there is a growing movement to reduce the code requirement for General Class from 13 to 10 WPM. According to Bill Pasternak, WA6ITF, "Slow-Code is the name given to an Amateur Radio Industry Group proposal to lower the General Class code speed requirement to 10 WPM." *(See The Washington Newsline on page eight.)* The NARA "jury" is still out on the wisdom of that move. The development is so new that we have not yet heard the opinion of our members.

When I suggest that "no-coders" be given access to the HF bands, I refer only to the Novice CW portions. Novices pass a five WPM code test and a multiple choice test, which is considerably easier than the Technician examination. When they receive their license, Novices are allowed to operate CW (with 200 watts) on the 80, 40, 15 and 10-meter bands. In my opinion, Technicians should be allowed to operate on these same frequencies, **even without a code test**. The "techs" have passed a more difficult written test, but this is not my justification for allowing "techs" on HF. Rather, it is in the best interests of ham radio to get more people learning and operating CW so that they can advance to General or higher classes.

And what do we have to lose? The dinosaurs howl like wolves that "no-coders" are not "real hams" if they don't know the code. Well, here is an easy way to encourage them to learn it. Here's a way to broaden their interests beyond VHF operation. Increasing the population of the Novice CW segments creates no more interference for the General and higher class hams, and I'm sure the Novices would welcome the additional contacts.

But what about international regulations. The ITU (International Telecommunications Union) says that for access to the high frequency spectrum (not medium frequency, by the way) they "must demonstrate a proficiency in sending and receiving Morse code."

Now will someone please explain to me, in simple words and phrases a senile old man can comprehend, how do you communicate with others by radio-telegraphy unless you are proficient in Morse? Letting Technicians operate CW on HF *would be self-complying with international regulations.* What better demonstration of proficiency than contacting someone else using CW? But the dinosaurs, who don't want any more QRM on their beloved HF bands, insist that this is a loophole. It's simply a way around the international regulations, they say. I dispute that. Let's call it "refarming" Part 97. "Refarming" seems to be a popular buzz-word in Washington these days.

Isn't Technician access to HF in the best interests of ham radio and ultimately our nation? The Japanese "refarmed" the international regs to permit its hams to have voice operation on HF without a Morse code test. They now have twice as many Amateurs as we do, **with one-quarter the population**. Their ham publication, *CQ*, is more than 800 pages thick! The Japanese told the ITU that with such low power (25 watts), signals would not escape its islands and therefore this was not a matter of international concern. Har! QRP operators work around the world with five watts or less.

And don't forget, the FCC is no stranger to "refarming" Part 97 when it is in the best interests of Amateur Radio. The international regs clearly state that the applicant must demonstrate a knowledge of Morse by receiving AND SENDING. The sending test was eliminated from the Volunteer Examinations given to prospective hams and those advancing license class. The FCC correctly believes that if you can receive the code then you can send it. Thus, even though the international regulations clearly specify sending and receiving, only a receiving test is required to demonstrate a proficiency in Morse code at test sessions.

What do you think, no-coders? If given access to HF under the Novice provisions (excluding voice on 10 meters), would you take advantage of the rules and learn Morse? I'd love to hear your comments.

73 de Don, W6TNS ❑

Rx Doc's Can Fill Your Prescription with.....

YAESU
Amateur Radio

Take one FT-890 and operate from your home in the morning

Take one FT-2200 and call me on the Autopatch

Take one FT-530 and call your friends on the 144 and 440 MHz bands

Doc's Communications
702 Chickamauga Avenue
Rossville, GA 30741
CALL 706-861-5610 or 706-866-2302 TODAY!
or send your FAX to 706-866-6113

We welcome newcomer inquiries

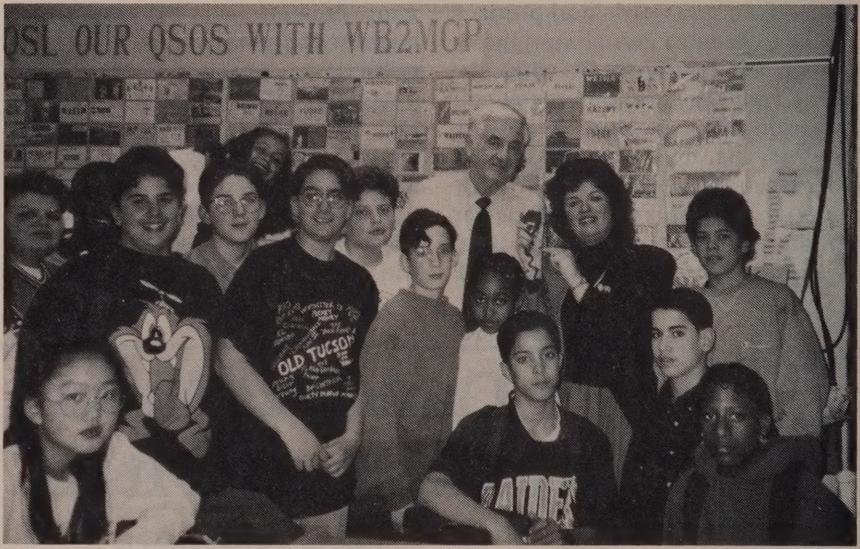
Carole Perry, WB2MGP

Never Too Old To Learn

by Carole Perry, WB2MGP

READERS OF my educational columns know that I subscribe to the belief of sharing one's enthusiasm for his or her hobby with anyone who will listen. You never know what unsuspecting soul is lurking out there just waiting to learn about the exciting hobby and service of Amateur Radio.

It won't come as a surprise to anyone, therefore, that I struck up a conversation one day with one of the school bus drivers who was newly appointed to the bus slot where I stand on afternoon bus duty. He made the mistake of asking me what subject I teach. His life will probably never be the same again! When he heard that I teach "Introduction To Amateur Radio" to 6th, 7th, and 8th graders at our school, he became genuinely interested. He told me that he always hears the youngsters on his bus talking about their fun times in ham radio class.


QSL OUR QSOS WITH WB2MGP
OLD TUCSON
RAIDERS

Ed has joined Carole and her ham radio classes on Tuesday and Thursday for the CQ All Schools Net.

> You never know what unsuspecting soul is lurking out there just waiting to learn about the exciting hobby and service of Amateur Radio.

Well, a few afternoons of follow-up conversations have led to a very unusual situation at our school. Ed Pedersen, 59 years old, is now a member of my afternoon ham radio class. I invited Ed, a retired pricing manager for AT&T, to join us on the CQ All Schools Net on Tuesdays and Thursdays on 10 meters. The very first contact he made was with Gary KB7PIX from the Navajo Indian Reservation in Sun Valley, Arizona. Ed told me, "I had just finished reading 'Bury My Heart at Wounded Knee' and I got new insight into the Indians and what they went through. The ham I spoke with from the Reservation made it all seem so interesting to me. I was delighted to get his QSL card."

Ed has since made several other contacts during his visits to our classroom. I can't tell you what a kick I get out of seeing his bus pull up with all his QSL cards displayed on the side of the of the bus where he drives.

Ed already had some background in communications. He became interested in Amateur Radio years ago when he bought a marine radio. He never really knew anyone who could tell him more about the hobby. At

MAKE LEARNING FUN

with the
CODEKEY 1000
Code Practice Oscillator

—Compact and Easy to carry
—Operates on 9V battery included
—Adjustable Volume
—Durable Metal Case
—Variable Sidetone

$19.95
+ $3.00 POSTAGE

TO ORDER
—CALL—
(718) 983-1416

Media Mentors inc.

P.O. Box 131646
STATEN ISLAND
N.Y. 10313–0006

this point, Ed is a regular participant in our class. The children easily accepted his presence there. From time to time I see Ed taking notes along with the other students. He has purchased books and license materials and is presently studying for his FCC novice exam.

The QSL cards on his bus provide a common ground for discussions with his young passengers every afternoon. They enjoy comparing radio contacts with each other. Ed says, "It's a very rewarding program, and it's an eye- opener for me because we don't realize as bus drivers, what is being done inside the schools. You can see how interested the students are in this radio program. You don't see that in too many classes today."

So never be shy about speaking up about all the good times a person can have with Amateur Radio. As in the case with our bus driver, Ed, it turned out to be a mutually benefical relationship for us all. I think the age spread in my class is just terrific!

73 from Carol, WB2MGP ❑

I'M LOOKING FOR MY 2 METER MOBILE RIG - THE AIRBAG BLEW IT OUT THE WINDOW!

Hardin Electronics

(800)433-3203

KENWOOD
Sales And Service

Featuring fine radios like the...

TH-78A dual band HT

RX118-136mhz AM
136-174mhz FM
438-450mhz FM
TX 144-148mhz FM
438-450mhz FM
CTCSS
DTSS
Message paging
V/U, VV,UU Rec
50 memories
expandable to 250
5 watts output
extra low output,
for extra long battery life

$30 COUPON

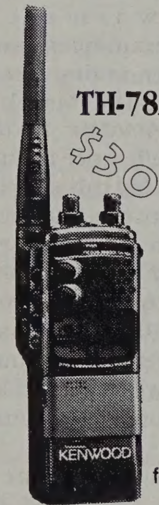
and the TM-241A 2m mobile.

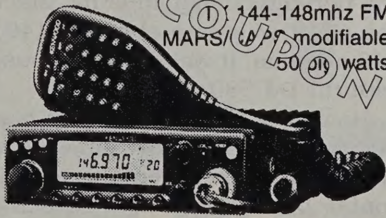
RX 118-136mhz AM
136-174mhz FM
TX 144-148mhz FM
MARS/CAP modifiable
50 [illegible] watts

$30 COUPON

(800)433-3203
5635 East Rosedale Street
Fort Worth, Texas 76112
Info:(817)429-9761
FAX:(817)457-2429
SHIP ALL 50 STATES
WE ACCEPT TRADES

VISA•MASTERCARD•DISCOVER•AMEX





NARA Reviews The Comet GP-9 VHF/UHF Vertical Antenna

by Donald L. Stoner, W6TNS

THE WHOLE project started when I built the two-meter groundplane antenna described in the March/April issue of *The Amateur Radio Communicator.* The difference in signal strength, when using this simple antenna, rather than the "rubber-duck" on the Alinco DJ-580, was spectacular. Actually, you don't notice signal strength that much on a handheld radio. Rather, what stands out as a difference is your ability to bring up repeaters that are further away from your home location.

About this time, NGC, Inc., started advertising their line of Comet Antennas in the *Communicator.* I was fascinated by the fact that I could have the same gain as a Yagi beam with their GP-9 vertical, non-directional antenna. Since the GP-9 was a dual-band, 146/446 antenna, it was perfect for use with the DJ-580.

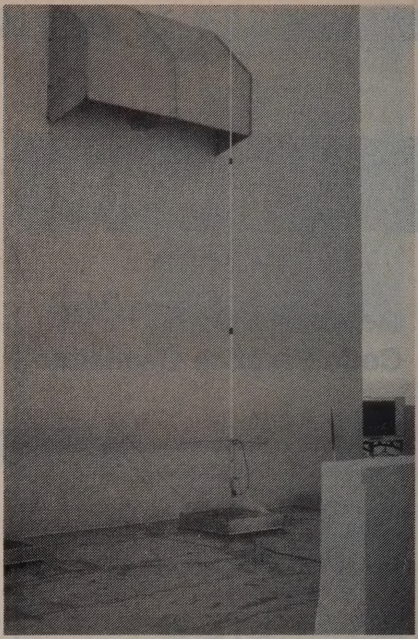
How does Comet build this sort of gain into a vertical? Simple—instead of adding elements on a horizontal boom, they add elements vertically inside a fiberglass shaft. The GP-9 uses three 5/8-wave elements on two meters and eight 5/8-wave elements on 446 MHz.

The result is a base or repeater antenna that stands over 17 feet tall and exhibits a real gain of 8.5 dB on 146 MHz and almost 12 dB on 446 MHz. How realistic are these gain figures? I have no way to prove or disprove them, other than to say that with this antenna, I can bring up virtually any repeater in Central Florida from my location in Clearwater Beach. I have no trouble working W4BWS in Palm Bay, Florida (near Cape Canaveral) from my QTH, which is 50 feet from the Gulf of Mexico. **That's clear across the state of Florida** with a vertical antenna! The VSWR at 146.82 measured 1:1. The reverse indicator didn't even flicker at that frequency. On 446, the VSWR was better than 1.3 on all frequencies in the repeater section of the band.

Incidentally, Comet has an optional duplexer available. The transmission line connects to one port and the duplexer "splits" this to provide separate input/output ports for the two-meter and 70 cm bands. We needed this for the YAUSU FT-736R. The GP-9 can be connected to dual-band handhelds, like the Alinco DJ-580, without a duplexer.

The antenna is shipped in three sections in a colorful plastic jacket so that it will fit on the UPS truck. The instructions were just a bit confusing to me (they usually are!). The wire between sections is secured by inserting it into a coupling and tightening an Allen screw (yes, Comet gives you the Allen wrench). I couldn't find the wire, but after a couple of minutes, I tumbled to the fact that you have to reach up inside the tube and slide the entire antenna assembly out the end for an inch or so.

Reliability has been stressed in Comet products. In the GP-9, all wire connections are soldered, rather than crimped. The vertical coils are held in place with plastic spacers, rather than simply "floating around" inside the fiberglass tube. The assembly is supported by foam spacers and slides in and out of the fiberglass housing with ease.



The black coupling sleeve does an incredible job of holding the sections together.

Everything is "washered" to prevent the entry of rain water. Comet uses an ABS connecting joint with pressure washers to hold the sections together and seal out moisture. Two drain holes are used in case one gets plugged, which would fail to discharge condensation.

The accompanying photo shows the GP-9 coming out of a skylight, directly over the hamshack at W6TNS/4. Even thought the vertical is only four feet or so from the elevator shaft building, this object does not seem to affect the performance or VSWR of the antenna. Naturally, I don't get out to the west, but—what the heck—that's the Gulf of Mexico in that direction. The antenna has already gone through a couple of pretty nasty storms and seems husky enough to withstand one of the real blows coming later this year.

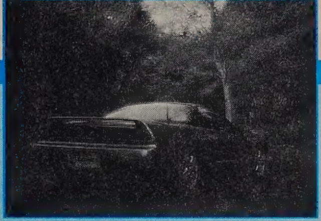
If you would like more information, you can obtain a data sheet on the GP-9 by writing NGC Co., 1275 North Grove St., Anaheim, CA 92806 or call them at 1-800-962-2611 for information. Comet has other antennas in this series, which are shorter or designed for single band operation. The GP-9 is available at all major ham radio stores for somewhat less than the retail price of $199.50.

73 de Donald L. Stoner, W6TNS ❑

COMET

MODERN, MULTI-BAND ANTENNA SYSTEMS

MOBILE ANTENNA PRODUCTS



Modern, high-performance stations use COMET Antennas, Duplexers, Triplexers and Accessories! COMET products are designed to provide an exceptional level of signal quality and coverage area. Whether operating mobile or from your base station, COMET products make you sound good. No other product line has the selection, convenience, quality and performance!

DUAL-BAND MOBILE ANTENNAS

FL-67S Dual-Band 146/446MHz w/Fold-Over, No Ground Plane Required

Gain & Wave:	VSWR:	Max Power:	Length:	Connector:
146MHz 4.5dBi 6/8 wave 446MHz 7.2dBi 5/8 wave x 3	1.5:1 or less	150 watts	4' 11"	Gold Plated PL-259

FL-62S Dual-Band 146/446MHz w/Fold-Over, No Ground Plane Required

Gain & Wave:	VSWR:	Max Power:	Length:	Connector:
146MHz 3.5dBi ½ wave 446MHz 6.0dBi 5/8 wave x 2	1.5:1 or less	150 watts	3' 5"	Gold Plated PL-259

NEW!

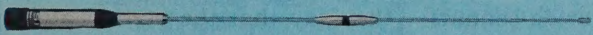
SB-7/SB-7NMO Dual-Band 146/446MHz w/Fold-Over, No Ground Plane Required

Gain & Wave:	VSWR:	Max Power:	Length:	Connector:
146MHz 4.5dBi 6/8 wave center-loaded 446MHz 7.2dBi 5/8 wave x 3	1.5:1 or less	70W FM	4' 7"	PL-259 or NMO style

NEW!

SB-5/SB-5NMO Dual-Band 146/446MHz w/Fold-Over, No Ground Plane Required

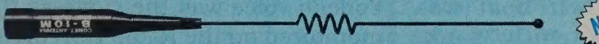
Gain & Wave:	VSWR:	Max Power:	Length:	Connector:
146MHz 3.0dBi ½ wave 446MHz 5.5dBi 5/8 wave x 2	1.5:1 or less	120W FM	38"	PL-259 or NMO style



NEW!

SB-2/SB-2NMO Dual-Band 146/446MHz

Gain & Wave:	VSWR:	Max Power:	Length:	Connector:
146MHz 2.15dBi ¼ wave 446MHz 3.8dBi 5/8 wave	1.5:1 or less	60W FM	18"	PL-259 or NMO style



B-10/B-10NMO Dual-Band 146/446MHz, Cellular Look-a-like

Gain & Wave:	VSWR:	Max Power:	Length:	Connector:
146MHz 0dBi ¼ wave 446MHz 2.15dBi ½ wave	1.5:1 or less	50W FM	12"	PL-259 or NMO style

B-20/B-20NMO Dual-Band 146/446MHz, Cellular Appearance, No Ground Plane Required

Gain & Wave:	VSWR:	Max Power:	Length:	Connector:
146MHz 2.15dBi ½ wave 446MHz 5.0dBi 5/8 wave x2	1.5:1 or less	50 watts	30"	PL-259 or NMO style

NEW!

SB-25/SB-25NMO Mono-Band 146MHz w/Fold-Over, No Ground Plane Required

Gain & Wave:	VSWR:	Max Power:	Length:	Connector:
146MHz 4.1dBi 5/8 wave center loaded	1.5:1 or less	100W FM	4' 9"	PL-259 or NMO style

COMET products are available from most major dealers. For customer service, or a complete catalog, please call us at 800/962-2611. We're confident COMET products and accessories will enable you to enjoy Amateur Radio to its fullest!

N.C.G. CO.
NCG

NCG COMPANIES
1275 North Grove Street
Anaheim, CA 92806
(714) 630-4541
FAX (714) 630-7024

NEW!

MINI SPEAKER/MIC

HM-P2K/F
Mini spkr/mic featuring full TX/RX quality!
Light weight, extremely small: 1'x2" with collar pocket clip.
HM-P2K: Kenwood Version
HM-P2F: Icom/Yaesu Standard/Alinco/etc.

TRI-BAND MOBILE ANTENNAS

CX-224/224NMO Tri-Band 146/220/446MHz, w/Fold-Over, No Ground Plane Required

Gain & Wave:	VSWR:	Max Power:	Length:	Connector:
146MHz 2.15dBi ½ wave 220MHz 3.6dBi 5/8 wave 446MHz 6.0dBi 5/8 wave x 2	1.5:1 or less	100 watts	3'	PL-259 or NMO style

FJ-15S Tri-Band 52/146/446MHz w/Fold-Over

Gain & Wave:	VSWR:	Max Power:	Length:	Connector:
52MHz 2.15dBi ¼ wave 146MHz 4.5dBi 6/8 wave 446MHz 7.2dBi 5/8 wave x 3	1.5:1 or less	120 W FM	4' 10"	PL-259

HF MOBILE AND HT ANTENNAS

HA-4S Quad-Band HF 40/*(20)/15/12/10 Meters w/Fold-Over

NEW!

Wave:	VSWR:	Weight:	Length:	Max Power:	Connector:
¼ wave	2:1 or less	1 lb. 14 oz.	4' 4"	120W SSB (200W SSB 28MHz)	PL-259

*L-14HS Optional 20 Meter Coil

SH-55 Super Flexible 146/446MHz HT Antenna

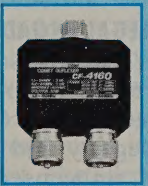
Gain & Wave:	Max Power:	Length:	Connector:
146MHz 1.5dBi ¼ wave 446MHz 3.2dBi 5/8 wave x 2	10 watts	15.5"	BNC

NEW!

CH-722SA High Gain HT Antenna
Gain & Wave: 146MHz 3.0dBi ½ wave
446MHz 5.5dBi 5/8 wave x 2
Max Power: 50 watts
Length: 35", 2 sections, 18" each
Connector: BNC

CH-32 Miracle Baby
146/446MHz HT Antenna
Gain & Wave: 0dB ¼ wave
Max Power: 10 watts
Length: 1.75"
Connector: BNC

DUPLEXERS AND MOBILE MOUNTS



CF-4106K, I, J,
146/446MHz
Band Pass, Ins Loss, Max Pwr.
1.3-150MHz, 0.1dB, 800w PEP
400-540MHz, 0.2dB, 500w PEP
Isolation: 60dB
CONNECTORS:

	4160K	4160I	4160J
Output:	SO-239	SO-239	SO-239
Low In:	PL-259	PL-259	SO-239
High In:	PL-259	N-Male	SO-239

RS-21
Trunk, hatchback, rear door (van, blazer, etc.) mount. Adjustable to virtually ANY angle. Rubber-coated base protects vehicle paint.

NEW!

RS-820
Heavy-Duty, Low Profile Trunk Lip or Hatch Back Mount. Rubber-coated base protects vehicle paint.

WS-1M
Multi-Adjustable Window Clip Mount.
11.5 feet of high quality coax. Gold-plated UHF Conns. for Antennas up to 40" in height.

NEW!

3D4M Standard Cable Assembly
13.5 feet of low loss coax. Gold plated UHF (PL-259/SO-239) connectors.

3D5M Standard Cable Assembly
Same as 3D4M, but 17 feet of coax

CK-5M Deluxe Cable Assembly
13 feet double shielded very low loss coax + 12" RG-188 teflon coax. Gold plated UHF (PL-259/SO-239) connectors.

CK-5M5 Deluxe Cable Assembly
Same as CK-5M, but 17 feet of coax

The Washington Newsline

by Bill Pasternak, WA6ITF

10 WPM CW PROPOSED

The biggest news out of Dayton involves a plan being hatched by Amateur Radio equipment manufacturers and magazine publishers. They want easier licensing requirements for access to HF spectrum. The Amateur Radio Industry Group members say the 13 WPM Morse Code requirement for HF access should be lowered to 10 words a minute—and they plan to work toward that goal. At their April 28th meeting, group members discussed the plan, including petitioning the Federal Communications Commission. Giving advice to the group is former FCC official Ray Kowalski. He tells group members the timing for such a move is excellent, since Washington's political climate is so heavily geared toward emerging technologies. The hottest selling ham gear lately has been VHF and UHF equipment. That reflects the strong growth in codeless technician class hams. But equipment manufacturers are frustrated by marginal profits from sales. Some manufacturers say current code requirements act as a barrier to hams who would otherwise populate the HF bands. Ray Kowalski, currently a Washington lawyer dealing in communications issues, tells group members they should act on their wishes before the year is out.

HI SEAS RESCUE

Two men rescued from a sinking boat in the Gulf of Mexico credit Amateur Radio for saving their lives. Larry Hooker, KB5ZNY, of Thaxton, Mississippi, and his sailing partner, Rett White, were returning from Honduras on Hooker's 35-foot sailing vessel "Off The Hook," when they ran into an unexpected storm and high seas.

Hooker had been in contact with his friend Randall O'Brian, KD5ZH, of West Point, Mississippi, since hoisting anchor on February 6th. The two were keeping regular schedules on 80, 40, and 20 meters and O'Brian was the first to learn of their difficulties and eventually contacted the US Coast Guard. O'Brian continued to help provide communication, along with the Coast Guard, who came up on 3.862 MHz.

On March 4th, Hooker and White were taken aboard the Coast Guard cutter Cushing. Their boat was towed, but subsequently sank. Hooker had visited his daughter, Tina, KB5YNN, a missionary with Global Outreach in the northeastern Honduras, which is accessible only by air or sea.

ILLEGAL BROADCASTER GETS CAUGHT

The FCC says it is denying Andrew R. Yoder's Application for Review of his $17,500 penalty for allegedly and repeatedly operating an unlicensed broadcast station. The FCC categorically rejected Yoder's argument that the evidence against him was purely circumstantial and insufficient to establish that he was legally in control of the so-called pirate station.

On February 22nd and 23rd, 1992, FCC engineers monitored transmissions from an unlicensed broadcaster on 7.415 Mhz. The station identified itself as Radio USA. The transmissions were eventually traced to Yoder's parents' home in Springs, Pennsylvania. When FCC investigators arrived, they found Yoder's car parked in the driveway and attempted to make a station inspection. But they were barred from entry by Yoder, who says that he is in no way obligated to allow Commission personnel to inspect his station.

While the FCC never did see the alleged pirate broadcast station, they say that the station and operator were positively identified by both voice and close-in direction finding. Later, audio tape analysis and voice printing indicated that Yoder's voice was the same as that monitored on the Radio USA broadcasts.

As previously reported, on May 21, 1992, the Laurel Maryland FCC Field Operations Bureau issued Yoder a $17,500 Notice of Apparent Liability to Monetary Forfeiture. The NAL was converted to a fine after the FCC rejected Yoder's response. Yoder was ordered to pay the fine before April 11, 1994, or face further punitive action.

NAL'S ISSUED IN FLORIDA

The FCC has issued Notices of Apparent Liability to Monetary Forfeiture to three Florida Citizen's Band operators for alleged violations of the Part 97 service rules that include the possible use of illegal power amplifiers. The NAL's issued were for $1,000, $1,500, and

$4,000. All of the CBers involved have indicated their intention to appeal. The FCC has also released a list of eight individuals cited for assorted violations including operating radio stations without proper authorization and operating on unauthorized frequencies. The fines here range from $250 to $6,400. No other details were given in the FCC release.

CALIFORNIA RETESTS RESCINDED

The FCC has done an about face on 42 of 59 Southern California hams it ordered to be retested three weeks ago. Late word is that the commission has told the ARRL VEC that it has decided to process the license applications from three examination sessions that have been under scrutiny for the past several months.

No explanation was given for the change of heart by the FCC, but it is believed that a number of those told to retest had instead threatened the government with violation of civil rights litigation. It is also believed that United States Senator Barbara Boxer had been approached by at least two applicants who asked that she intercede with the FCC on their behalf. A call to Boxer's office for confirmation or denial has not yet been returned by the Senator's staff.

Only one company can offer you
the world of ham data
so completely.

"ONLINE" U.S. & INT'L CALL DIRECTORY
OVER A MILLION CALL SIGNS
Hamcall online service gives you ALL hams via your computer & modem. Updated each month! Only $29.95 per year. Unlimited use—24 hours a day—you pay for the phone call.

U.S. AMATEUR RADIO MAIL LISTS
Labels, floppy disks, CD-ROM, mag tape

HamCall CD-ROM
US & International Callsign Lookup
Over 1,000,000 listings and 100 Countries
Includes U.S. Clubs & Military Stations. ICALL program looks up: name, address, expiration date, birth year, license class, county, lat/long, area code, time zone, & elevation. Retrieve by any data element on PC, call, name and zip on the MAC. Hundreds of new programs are on this disc- see the Electronics Software Compendium CD-ROM for a larger collection of software.
•No hard disk required • Print Labels • Export to hard/disk or floppy • TSR runs from text window • Updated every April & Oct • Standing orders accepted • Dealer discounts for 6 or more • Latest public domain PC & MAC software. Same low price of $50.00 plus $5.00 shipping.

New CD-Rom
Electronics Software Compendium
The Electronics Software Compendium is a collection of programs and data files that pertain to electronics, broadcasting, amateur radio and SWL activity.
Over 15,000 files in total. The disc is updated and issued semi annually in April & Oct. Over 200 megabytes of material is resident on this CD-ROM, for MAC & PC. Send your order to Buckmaster Publishing, $25.00 plus $5.00 shipping.

BUCKMASTER
Route 4, Box 1630 • Mineral, VA 23117
☎ 703:894-5777
800:282-5628
703:894-9141(Fax)
Internet: info@buck.com
VISA

While a number of hams trying to upgrade may be off the hook, the same is not true for the three dozen or so California Volunteer Examiners ordered suspended last year by the FCC. The commission still does not want them testing. None of them have been reinstated by their respective VEC's and the government indicates that the probe of their activities is still ongoing.

EDITORIAL NOTE: EXAM CHEATING

And if we may be permitted a brief editorial opinion. Be it California, Florida, Texas, New York or anywhere else, there is simply no place in ham radio for those who may be profiteering by bringing in people who do not meet the minimum criteria for entry. We at Newsline have made exposing those behind any testing scam a number one priority. This is one matter that we at Newsline will not let die in the Washington bureaucratic red tape.

CALIFORNIA HERO

Amateur Radio recently made headlines in Acton, California, when 36-year-old Chris Killian, N7IOV, helped capture two robbers. According to the Antelope Valley News of Lancaster California, Killian was approached by an armed man in a McDonald's restaurant. The alleged felon inquired about Killian's handheld radio. When the man and an accomplice left the eatery, Killian, who is a reserve deputy, followed and relayed their route to another ham who contacted sheriff's deputies. The two suspects were picked up that night and charged in the hold-up. Killian told the News that he ordinarily doesn't carry a radio with him but that he'd been using the handheld the previous weekend to test several area repeater stations.

MIR—SAREX LINK

The space shuttle and the Russian Mir space station have QSOs by ham radio. On April 13th astronaut Jay Apt, N5QWL, contacted Rita Iaquinto, VK3CFI, in Melbourne, Australia. At the same time Russian cosmonaut Valery Polyakov, U3MIR, hooked up with Graham Ratcliff, VK5AGR, in Adelaide. The Australians then used a telephone link to connect the two spacecraft as both passed over Australia, at 5:36 PM Australia time. The Shuttle to Mir contact was arranged by the Shuttle Amateur Radio Experiment Working Group.

FCC URGED TO RAISE FINES ON INDECENT BROADCASTS

Members of Congress are telling the FCC it should impose higher fines on broadcasters who use indecent language on the air. The FCC has already fined shock-jock Howard Stern and the company that broadcasts his programs over $1 million for using indecent language in his programs. Stern and the company are appealing the fines, saying they violate free speech protection.

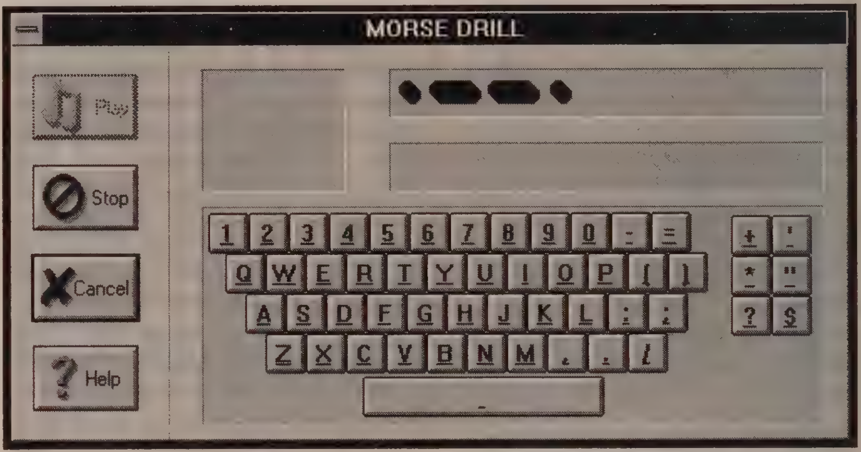
But FCC Chairman Reed Hundt is saying that even if higher monetary forfeitures are mandated, the commission lacks the resources to handle all its responsibilities. Hundt told a House of Representatives Appropriations subcommittee hearing on April 18, a staff shortage was hindering efforts to handle license and merger applications and to increase competition in telecommunications and cable TV. Hunt added that FCC resources are not sufficient to achieve the agency's goals and that he would like another 200 full-time staff to join the 2,050 now on staff. The The Office of Management and Budget must approve any such staffing request.

73 de Bill Pasternak, WA6ITF ❑

New Code Practice Program Proves To Be A Hit At The 1994 Dayton "Hamvention"

by NARA Staff

IT WAS ONLY MINUTES after the doors opened on Friday at the 1994 Dayton "Hamvention" that it became obvious NARA had a "winner" in *NuMorse For Windows*. We were totally sold out by noon on Saturday, 24 hours later, and had to take orders for later shipment. People simply tried the program on our computer for a minute or two, and then bought a copy. It sold itself! It was also obvious that *NuMorse For Windows* was fully featured. We were able to answer "yes" to every "will it do this" question.



Play Mode—NuMorse is one of the most spectacular Morse code training and testing programs ever developed. After a log-on screen, the user selects the PLAY pull-down menu which features three selections; Continuous, Drill, and Statistics. Selecting either of the first two choices clears the screen and shows a keyboard such as that in the accompanying photograph. In continuous mode, you are required to specify a source for the characters. This can be a random stream, random groups, characters from a file or from the keyboard. In the latter instance, you press a key to hear the sound and see the representation on the screen.

I prefer having someone create an ASCII file with a word processor and then "play" that file in the continuous mode. It is fascinating to watch the on-screen keyboard—the keys actually move. Even the space bar depresses between words!

In the drill mode, the computer sends the character and you are required to press the right key (or mouse it) corresponding to the sound heard or dits and dahs seen on the screen. The computer will indicate if you are correct or not and even save a file of correct and incorrect selections so that you can later see what characters require further practice. There are several drill modes where you guess the character sent and you can configure how NuMorse responds to your guesses. NuMorse will collect detailed statistics on your performance while training, and you can use these statistics to automatically adjust code settings.

Timing—As they say, timing is everything. On NuMorse, everything is adjustable *and I do mean everything*. You can even change the attack and decay time of the waveform which drives the internal PC speaker! The tone is variable between 200 and 2,000 Hz so that you can find the resonant frequency of tiny pizeo-buzzers in laptops to obtain the loudest volume. You can also select the tone you find most pleasing. I prefer about 700 Hz. The dits and dahs, the inter-character and inter-word spacing can be adjusted in one millisecond length increments.

Speed—The speed at which the characters are presented can be up to 40 WPM or made adaptive. In the latter mode, NuMorse adapts the code speed to your abilities by tracking mistakes. NuMorse allows you to alter the timing to send code as slowly as you like, then speed up automatically as you become more proficient, or it can speed up automatically every "X" seconds.

Filters—One of the most valuable features is the ability to select exactly what characters NuMorse will send to you and how often they are sent. You can start with just a few characters, then add extra characters whenever you wish, using the filter feature. You can select sending letters, numbers, punctuation, prosigns or any combination with the custom filter feature. The customization for all options can be saved as a configuration file and reloaded. This is important if a number of people are practicing with the same program. They can each have their own custom filters.

External Support—NuMorse supports all *Sound Blaster* versions and the compatible variations of these sound cards. The output you hear is a pure sine wave that is ideal for making tapes which you can later use in your automobile cassette player. Have someone make a practice file on the word processor. Then play it in the continuous mode, after having pulled out a speaker plug and inserted it in the microphone jack of a tape recorder. Using this scheme, you can have a new and different code practice tape recording each day as you drive to and from work.

NuMorse lets you output the Morse to an external hardware port for keying a transmitter or whatever. You can set the port address and even the bit configuration for that address.

I could go on and on extoling the virtues of NuMorse For Windows but you need to use it to learn all its capabilities. I believe you will agree it is one of the most sophisticated programs ever introduced for Morse training and testing. You can obtain NuMorse For Windows (#S411) at all major ham stores or by calling NARA at 1-800-GOT-2-HAM. The price is only $24.95 ($1.50 shipping & handling).

73s from NARA Staff ❑

CODE PRACTICE OSCILLATORS ARE STILL POPULAR

This custom-made code practice oscillator, from Media Mentors, Inc., is just the ticket for motivating children to practice the Morse code. The practical, cost-efficient classroom tool operates on a standard nine-volt battery which is included with the CODEKEY 1000. The "key" (which does not show very well in this photo) is a large rectangular, pushbutton just forward of the speaker magnet in the center of the board.

Youngsters love the hands-on experience of operating their own keys. Every child in your class will want to have his or her own. The CODEKEY 1000 is a good fund-raising item for a school. Your kids will think they're having fun—you'll know they're learning. For more information, write Media Mentors, Inc., P.O. Box 131646, Staten Island, NY 10313-0006, or call (718) 983-1416.

WHAT IS SUPERLINK?

If you are interested in working Canada from the midwest, contact Paul Emeott, K0LAV. Superlink is an amateur radio repeater linking system that links together two-meter repeaters into Wisconsin, through Minnesota, North Dakota, and north to Winnepeg, Canada. This linking system uses a "backbone" of 440 MHz radio signals to connect together a system of Amateur Radio two-meter repeater stations. Other links to the east and south will be added in the near future. Presently there are also efforts underway to tie Superlink to the Evergreen network in the northwestern states. (Thanks to *Groundwave* and the St. Paul Radio Club)

WANT TO BE ON TV? TRY ATV!

Even no-code Technicians can put an Amateur television (ATV) station on the air—and it's expensive. You can just watch the pictures broadcast by others, if you are on a budget. A typical ham TV station can send pictures about as far as your home-town commercial TV station. This is because ATVers use a direction antenna (called a Yagi) and a receiver which is more sensitive than the typical TV set. The ham TV transmitter and receive converter are in one box with simple controls. You can read all about ham radio television by ordering our book, ATV Secrets (see page 31 for more details).

HOW TO FIND OZ ON A NEW HAM VIDEO

Is Hiawatha, Kansas, the town at the end of the Yellow Brick Road?

Seventeen-year-old Cathy Gilliland, KB0FDU, who lives there says that it is. In early 1995 we will all find out first hand when the new ham radio promotional video titled *This Is Amateur Radio* is completed and released. The show features Cathy and her father Charlie, WA0KDC, and will be taped in several locations nationwide including Hiawatha, Kansas.

This Is Amateur Radio is being co-produced by David Black, KB4KCH, Roy Neal, K6DUE, and Bill Pasternak, WA6ITF. Neal and Pasternak are part of the team that brought you the award winning *New World of Amateur Radio, SAREX—The Shuttle Amateur Radio Experiment*, Amateur Radio's Newest Frontier and Ham Radio in Space. The 30-minute docu-drama format of *This Is Amateur Radio* will be a total departure from any ham radio video produced to date. ❑

Another View of Closed Repeaters

by Don Stoner, W6TNS

I CAN'T RECALL A TOPIC that has brought in more correspondence than my editorial a few months ago about closed repeaters. It was my position that closed repeaters were undemocratic and an improper use of Amateur Radio spectrum.

I received many letters that both agreed and disagreed with me. Most were well-written explanations of the writer's point of view. Every few days my opinion would see-saw between pro- and anti-closed repeater.

As is often the case, there is more to the story than meets the eye and I am going to confess to brain damage. Since this may not happen again before the turn of the century, you are invited to savor this article.

It started with my evaluation of a Comet GP-9 146/446 combination vertical antenna (reviewed elsewhere in this issue). I'd been off the air for several years as a result of having my freedom of speech throttled by the condo association where I reside in Florida. While the matter is still in litigation, I took the position that the skylights were simply my ceiling windows and I proceeded to install the Comet right through the "window."

I unpacked my old faithful YAESU 736R and connected the Comet duplexer to the antenna jacks. This antenna really works. Suddenly I went from Amateur Radio hermit status to being able to work repeaters all over the middle of the state of Florida. As I thumbed through the *ARRL Repeater Directory*, I found that half the stations didn't respond to my "kerchunking." What's this? A station five or six miles away and I can't bring it up? Then, lo and behold, a local comes on the same repeater and starts chatting with a friend. A closed repeater, eh? I've heard of them. That's just not fair for them to exile a handsome, personable and world-famous magazine editor from their repeater.

Long after the issue went to press, reality came crashing down around my ears. The repeaters that ignored the trusty 736R signal employed *tone encoding*. Here in Florida we have almost constant tropospheric ducting (see the T3C questions in your Technician test), which seems to peak around sunrise and sunset. On one channel, I can key up four different repeaters!

To avoid this, repeater operators employ a tone decoder squelch (called CTCSS—Continuous Tone Coded Squelch System). If the repeater does not "hear" the selected tone frequency, the repeater will not activate. The user must transmit this single specific frequency, somewhere between 67 and 250 Hz, along with his or her signal. The subaudible tone is impressed on the audio signal. It is at a very low level, not at all annoying, and is referred to as a subaudible tone (even though it is audible on most radios). Requiring a subaudible tone for activation of the repeater insures that you only bring up the system you wish to use.

Here's where things get interesting. I thought that a deluxe rig, as expensive as the 736R, would have built in CTCSS. The keypad allows you to select the tone encoding frequency and to determine if the subaudible tone is impressed on the audio. When you transmit the "ENC" light shows on the display. Can you blame me for thinking the rig was sending an encoded signal and the stupid repeater was closed?

Guess what? It's not the repeater having an attack of stupid. *Tone encoding is optional on the 736R.* I picked up an FTS-8 from the guys at Amateur Radio Supply in Clearwater and installed it in a matter of minutes. What a difference! Now I could bring up virtually any repeater I tried to activate. These repeaters were not really closed at all, but simply trying to fend off the interference caused by tropo ducting.

About that time I also discovered the tiny "c" in the *Repeater Directory* than indicates that the repeater is closed. By trying various tones I was able to bring up a closed repeater in Orlando. I must tell you that even though I was an "outsider," the club members inhabiting the repeater were the nicest, most courteous folks you would ever want to meet. Obviously I was outside their service area and not particularly interested in joining their group, 100 miles away. Even so, they invited me to drop by anytime and no one even mentioned that the repeater was "closed."

Having confessed to brain damage, I'd like to reprint two of the best letters that NARA received on the subject of closed repeaters. Clearly this is an issue where there is no right or wrong answer. But, if it ain't broke, I've come to the conclusion we shouldn't try to fix it!

Dear Don:

I am a new ham (KE6EER) and, as you can see, an attorney.

I also live in a state where the problems to be found on repeaters abound. I am a member of a "closed" 440-band system, and was quickly made aware of both sides of the "should" and "should not" issue. That is, I was quickly apprised that there is resentment on the part of some hams to the very mention of 440, as these repeaters are mostly closed out here in California. However, in an even shorter time-frame, I became aware of the strange behavior of some hams, which makes such (closed)systems highly attractive.

I doubt very much that anyone's opinion about whether such systems are "good" or "bad" can be changed by my thoughts. But, I dispute the logic that the existence of a fee to transmit on certain frequencies via a particular radio (repeater) owned by a private party in a small, defined geographic area can be described as a violation of the rights of hams to use "free" airspace.

A given frequency is still available to anyone who wants to use it on a line-of-sight basis, and anyone can listen to any frequency. All that is in issue here is the use of someone's ingenuity and funds in providing a radio with a particular frequency "pair" in a particular geographically desirable spot— and perhaps even pay rent for it! The most a repeater may be monopolizing is coordination from the FCC. Otherwise, the airwaves are as free with closed systems as they are without them.

As you point out earlier in your article, it is useless to try to change human nature. As long as some people are apparently drawn to the anonymity of ham radio to behave in ways which are mean, low-spirited, or down-right destructive (witness the Tim Seawolf syndrome) there will be a need to have systems where access to the system (not the frequencies) is limited. I think the "rights" of people with sufficient initiative to arrange such systems are far clearer than the "rights" of others to ride their coattails.

Sincerely, E. Carroll Straus, Esq.
KE6EER

We also received a superb letter from a repeater builder/operator:

Dear Don:

I had occasion to read your editorial regarding unresponsive repeater users and closed repeaters in your March/April issue. Please permit me a couple of comments, particularity regarding the latter. I have been involved in building and operating repeaters along with providing emergency communications services since the late sixties. I was a county Emergency Coordinator in Wisconsin during the seventies and am now the ARES Emergency Coordinator and RACES Radio Officer for the island of St. Croix.

I fully understand the YL who resorted to cellphone for her emergency communications since I have come in contact with many "hams" through the years who feel imposed on or totally impervious to the service side of our hobby. The only answer I can give to this is that the training we provide to newcomers does not place enough emphasis on the service aspects and obligations which go along with the privileges of license.

Unfortunately, this does not exonerate the many old timers who also have never participated in service activities and have no intentions of doing so. Perhaps it just indicates that we do, indeed, have a cross section of people who participate in our hobby.

Regarding the issue (or non-issue) of closed repeaters, I believe the opinion you expressed is shortsighted and unwarranted. First, for explanation, I have never been involved in a closed repeater, so I'm not justifying a position which I have ever proposed or under which I have ever operated. All repeaters I have ever been involved with were open access.

I am sure there are persons or groups which subscribe to the

(Continued on page 24)

BROWNVILLE SALES CO., INC.
Route 2, Box 104, Stanley, WI 54768 • 715-644-2112(Voice)/715-644-2621(FAX)

SAVE on all ALINCO Radios
DR-130 High-Power 2M Mobile...
ONLY $329.00
DJ-580T Dual-Band HT...
ONLY $399.95

...And SAVE even more on these ALINCO Close-Outs
DJ-560T/A 2M/70cm Twin-Band Mobile . . . . Close-Out Priced at **$299.00**
DR-592T 2M/70cm Twin-Band Mobile
(590 Upgrade) . . . . Close-Out Priced at **$499.00**
DJ-162TD SM FM HT (Dry Cell) . . . . Close-Out Priced at **$199.00**
Ni-Cad Battery and Charger . . . . Close-Out Priced at **$35.00**
with radio purchase

Stamps—Flyers
ARRL, NARA, Artsci, etc. books, video/audio/computer tapes at a discount!
1993 ARRL "Now You're Talking" for no-code license $15.00 • 9 dB Gain 2M Base Antenna $32.00
Saving you money at BROWNVILLE SALES CO., INC. . . . Your Discount Ham Source

Jerry Marsh, AA7UF

Digital Basics

by Jerry Marsh, AA7UF

> A more recent code which is widely used is ASCII (American Standard Code for Information Interchange). ASCII is a true seven level code.

IN THE LAST ISSUE I covered how information is stored in a digital mode. We examined three different codes: **Baudot**, **AMTOR**, and **ASCII**. Baudot is a five level code (five ones/zeros make up each character), AMTOR and ASCII are seven level codes. Each one or zero in these codes is called a **bit** (short for **BI**nary digi**T**). The position of each bit or binary digit in a code has significance, just as the position of the decimal digits in a decimal number has significance. Thus the binary number "01" is different than "10" just as the decimal number "25" is different than "52".

When we represent a code on paper, such as 00011 ("A" in Baudot), we normally think of the right most bit as the least significant bit (LSB) and the leftmost bit as the most significant bit (MSB). We often number the bits for reference (starting with "0" for the LSB):

43210 *43210*
00011 11000

In the case of "00011", bits 0 and 1 have a value of 1 or ON, bits 2, 3 and 4 have a value of 0 or OFF. This is different than the binary code "11000", which has bits 3 and 4 set ON. This has significance when we transmit one of these codes via radio as both the transmitting and receiving end must agree which sequence the bits are being sent—that is, which bit is being sent first, the least significant bit (LSB) or the most significant bit (MSB).

Actually, sending digital binary signals over radio is quite involved. A major problem is that most radios are not designed to transmit digital signals - they are designed to transmit analog signals. To solve this problem (not just for radio transmissions, but for data communications in general), a device called a **MODEM** (short for **MO**dulator/**DEM**odulator) was developed.

The purpose of a modem is to convert digital signals to analog, and analog signals to digital, while preserving the binary information contained in the code being sent.

There are two portions to a modem, a transmit portion and a receive portion. The transmit portion takes a digital signal from a computer or terminal and converts it into an analog signal and sends it out over a communications link. The receive portion, which operates independently from the transmit portion, receives an analog signal over a communications link and converts back into a digital signal to give to the computer.

A common way of doing this is called Audio Frequency Shift Keying (AFSK). In the transmit portion of the modem, if a **0** is being received on the digital input to the modem, the modem might produce a **1200 Hz** audio signal as output from the modem. If a **1** is being received, the modem might produce a **2200 Hz** audio signal. Thus if the digital signal 1010 was received by the modem on its digital input, it

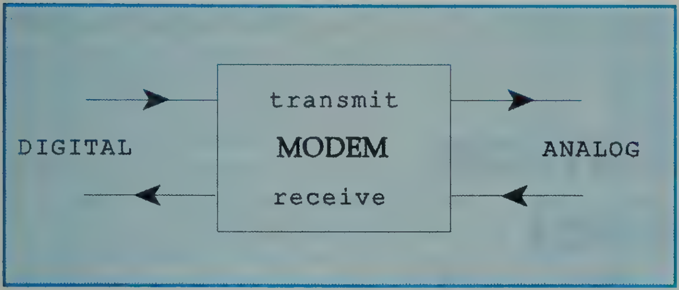


Figure 1

would produce an audio signal 2200, 1200, 2200, 1200 Hz. The output audio signal will shift in frequency in direct relationship to the digital signal received by the modem (thus the name: Audio Frequency Shift Keying).

In the receive portion of the modem, the process is just reversed. When a **2200 Hz** audio signal is received on the analog input to the modem, a digital **1** is produced on the digital output from the modem. When a **1200 Hz** audio signal is received, a digital **0** is output from the modem.

By connecting two modems to two transceivers in such a way that the audio output of the modem is transmitted by the radio, and the radio receiver audio is fed into the audio input of the modem, it is possible to transfer a digital signal to a distant location:

If a **zero** is input into the modem at location "A", the modem generates a **1200 Hz** audio signal which is transmitted over the air to location "B". The radio receiver at location "B" receives the **1200 Hz** tone, and feeds it into its connected modem. The modem at "B" outputs a digital **zero**. When the digital signal at "A" is changed to a **one**, the tone changes to **2200 Hz**, and correspondingly the receiving station/modem converts this to a **one**.

When station "B" transmits and station "A" receives, the same process takes place. Most hams do not have sufficient equipment to transmit and receive simultaneously, so this is a one way at a time type conversation.

A fundamental principle to understand about this type of transmission, is that although analog signals are sent between the radios, they are still binary in nature—that is, at all times they are in one of two states corresponding to one or zero. In this example the analog signal is either at 1200 Hz or 2200 Hz—no other frequency has any meaning.

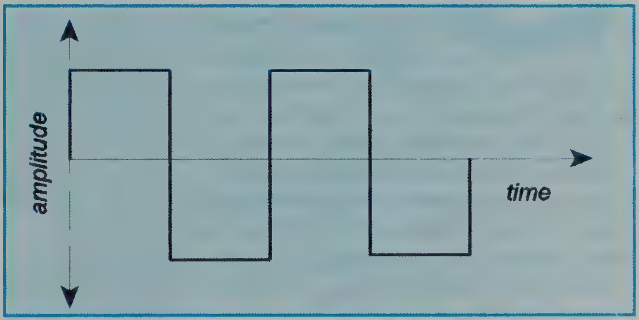


Figure 3

In order for successful digital communications to take place, both ends of the conversation must agree on a number of things. They must agree on the code (Baudot, AMTOR, ASCII). They must agree on which order the bits are sent (MSB first vs LSB first). And they must use the same type of MODEM on each end.

Another consideration in sending signals between two stations is the rate at which the bits are sent. If I sent a series of alternating zeros and ones (01010101 ...), it would look something like *Figure 3*. The measure of the number of these alternations per second is called the **bits per second (bps)**. This is similar in concept to words per minute (WPM) in Morse Code. A typical Packet radio station sends at 1200 bps on VHF and 300 bps on the HF band. The two ends of a digital transmission must agree on the bit rate in order to successfully communicate.

(The term BAUD is commonly used interchangeably with bps, although there is a technical difference between the two.)

Next time I will discuss in more detail the connection between the computer or terminal and the modem.

73, Gerald L. Marsh, AA7UF ❑

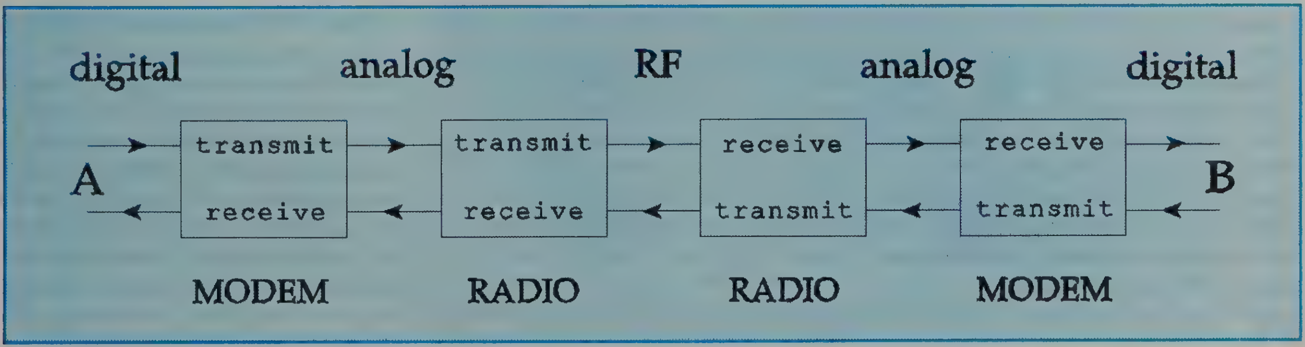


Figure 2

ComFocus Corporation Introduces A Digital Communications Receiver

by NARA Staff

SHORTLY AFTER doors opened on the 1994 Dayton "Hamvention" it became obvious something was "going on" over on the next isle. There was a mob of people milling around in front of one booth. During a lull in talking with people, I wandered over, elbowed the women and children aside and made my way to the display table. What I saw was truly astounding. A real honest-to-goodness digital receiver called SoftWave(tm).

The SoftWave receiver combines the fascination of shortwave and VHF, the horsepower of digital signal processing (DSP) and the user friendliness of Microsoft Windows. Each SoftWave package contains a receiver module, a DSP card for a standard PC slot, and program disks, along with a cable and an easy-to-read manual.

Six different radio "personalities" await the user. With a click of the computer mouse the user can choose from a standard AM radio, a communications (HF) radio, a VHF receiver/scanner, a world radio, a time synch radio and even a spectrum analyzer. Each personality has its own characteristics. SoftWave TM is actually several separate receivers in one package. And because the radio personalities are completely under software control, new features are as easy to install as copying a floppy disk.

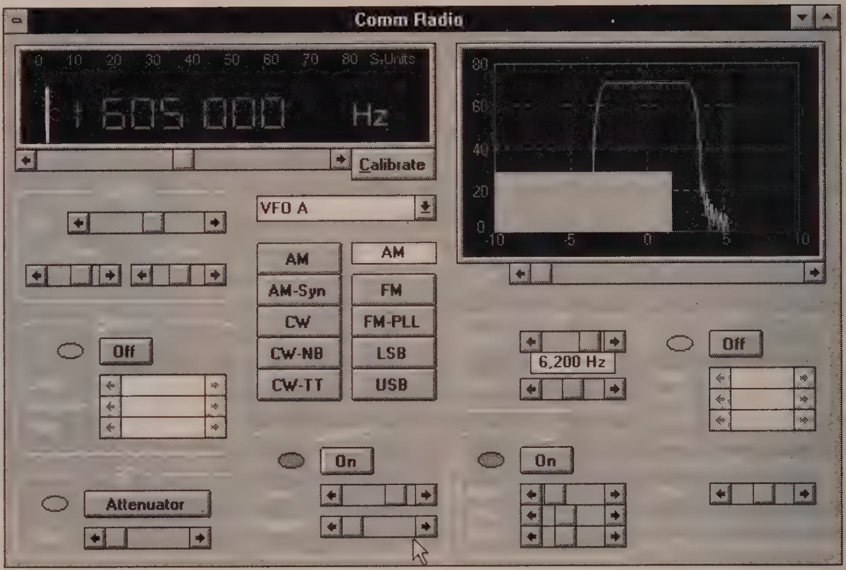


Figure 1—The Communications Radio personality. Note for some reason the frame grabber software converted the spectrum analyzer display into a grey box.

The Communications Radio—(see *Figure 1*) looks like the front panel of a high end shortwave receiver, with one major difference: in the top right corner of the screen a spectrum analyzer shows the received signal in real-time. The screen allows you to tune continuously (with 1 Hz precision), from 0.5 to 30 MHz (HF) and 108 to 174 MHz (VHF). Completely digital controls such as blanker, squelch and AGC provide incredible flexibility. Digital audio controls include volume, high and low filters (treble and bass). Perhaps the most interesting feature of the Communications Radio is the spectrum analyzer. Both the signal and the IF filter are displayed in real time. Adjust the IF filter to one of 46 settings from 11 kHz to 56 Hz. Set the tunable notch filter to knock out those stray signals. This is fun! And we're just getting started!

The VHF Radio—(see *Figure 2*) tunes continuously from 108 to 174 MHz. You can load your favorite stations into one of the scanning groups provided by ComFocus or create your own. SoftWave's scanning database will store up to 5000 stations, identified by name, number, frequency or any other ID method you choose. Split and priority stations can be identified or changed with a few clicks of the computer mouse.

The World Radio—For the novice shortwave enthusiast, or even those who don't know exactly where to find Radio Moscow at 0100 UTC, SoftWave's World Radio solves the problem. By selecting this personality, a world map appears on the screen. Use the mouse to point and click on a particular continent and SoftWave gives you a list of all the stations currently on the air broadcasting from the selected location. SoftWave's digital signal processor tunes up to 100 stations per second and indicates the reception quality for each right on the screen! You can ask the database what's on the air in an hour (or two) or select from news, sports, general interest or user priority. Point and click again and the radio automatically tunes to the selected station. Or select "auto tune" and scroll through the stations, listening to each.

The Time Synch Radio displays all the frequencies on which WWV is transmitting. SoftWave will automatically show the signal strength for each. You can select the strongest signal and even reset your computer clock to the correct time.

The Wide Band Spectrum Analyzer, a separate personality, displays all signals in a bandwidth up to 5 MHz. This is especially useful for finding new signals.

SoftWave also includes a very sophisticated Morse Code decoder. Called the **Morse Code Translator**, this window displays the text as it is received. It also shows the words per minute, the error rate of the transmission, the relative quality of the transmission and the relative confidence of the digital decoder. By selecting the options you can also decode Q signals and commonly used abbreviations. SoftWave even has Word Guess, a proprietary method of "guessing" the word that is being received when the signal conditions are poor. By clicking on the Zoom button, SoftWave automatically narrows the IF filter bandwidth and centers the signal.

Since most of SoftWave's computations are done by the DSP chip, the computer is free to run other Windows applications. You can actually tune to your favorite station and play Jet Fighter at the same time (not at work, of course). Perhaps you want to type a letter on Microsoft Word. No problem, SoftWave can share the screen with any Windows programs. This allows you to click the mute button when the boss is coming.

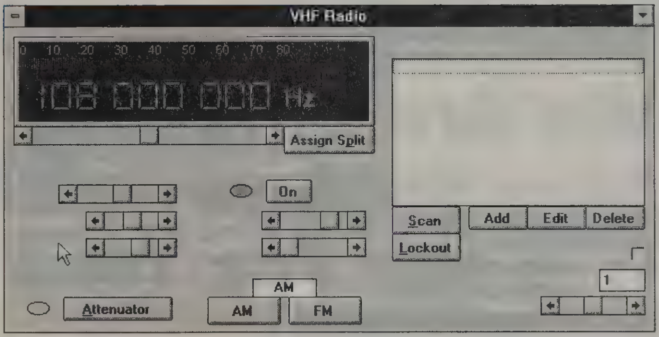


Figure 2—The VHF Radio personality operates between 108 and 174 MHz.

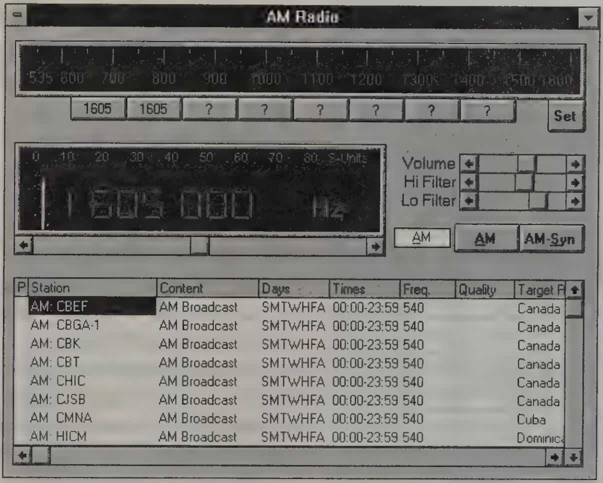
SoftWave includes a complete database which is accessible to all of the personalities. Current program schedules from shortwave broadcasters throughout the world are preinstalled. You can select from one of SoftWave's stations or add your own.

Perhaps one of the most unique features of SoftWave, if there aren't enough already, is that all power to the receiver module is provided by the RS-232 cord from the PC. That's right, no power cords! This means that you can locate the receiver module under the desk, in the closet or anywhere within the length of the provided cord. Try to imagine this: a shortwave receiver, VHF scanner digital signal processor, spectrum analyzer, Morse code decoder, and database of worldwide programming in your office and nothing on your desk except for a computer monitor.

As expected from a digital receiver, SoftWave has world class performance: Noise figure of 9 dB (HF) and 11 dB (VHF), Dynamic Range of 97 dB, HF Sensitivity of -130 dBm/(0.14 uV) (CW at 300 Hz, 10 dB SNR), IF Rejection of 8 5 dB, and a Notch Filter Attenuation variable up to 40 dB.

If you would like more information on SoftWave, contact ComFocus at 1-800-SOFT-WVE (763-8983) or by writing Christopher Olson, ComFocus Corporation, 6160 Lusk Blvd., Suite C200, San Diego, California, 92121.

73 from NARA Staff ❑



P	Station	Content	Days	Times	Freq.	Quality	Target F
	AM: CBEF	AM Broadcast	SMTWHFA	00:00-23:59	540		Canada
	AM CBGA-1	AM Broadcast	SMTWHFA	00:00-23:59	540		Canada
	AM: CBK	AM Broadcast	SMTWHFA	00:00-23:59	540		Canada
	AM: CBT	AM Broadcast	SMTWHFA	00:00-23:59	540		Canada
	AM: CHIC	AM Broadcast	SMTWHFA	00:00-23:59	540		Canada
	AM: CJSB	AM Broadcast	SMTWHFA	00:00-23:59	540		Canada
	AM CMNA	AM Broadcast	SMTWHFA	00:00-23:59	540		Cuba
	AM: HICM	AM Broadcast	SMTWHFA	00:00-23:59	540		Dominic

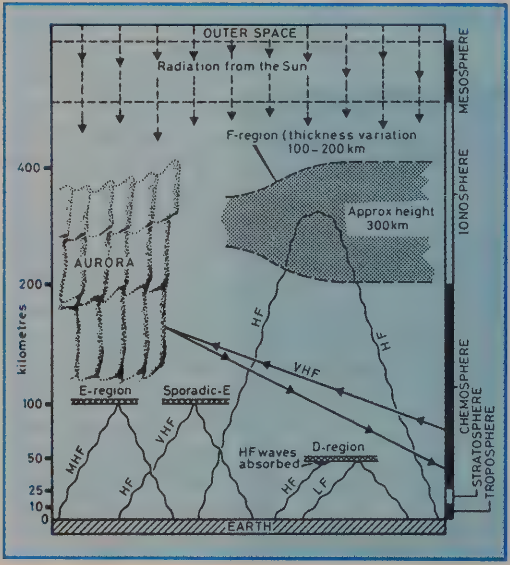
Figure 3—The AM Radio Personality includes a complete database of radio stations all over the world.

We Are Entering The Sunspot Low—What Does It Mean For You?

by Kurt Feldmesser*

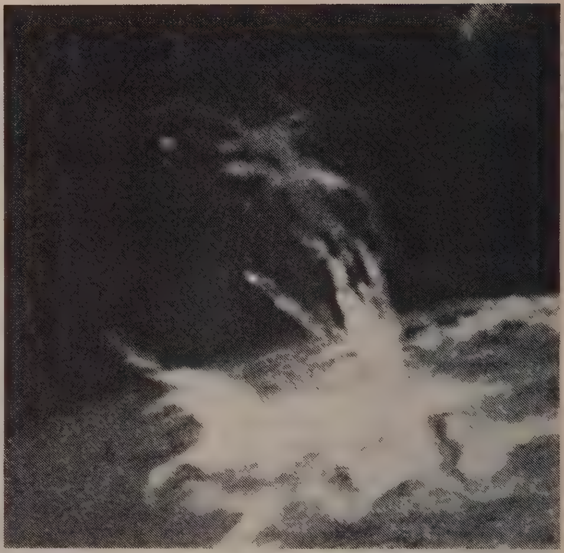
Propagation of HF Radio Signals—High Frequency (or short wave) radio signals can travel much further than line-of-sight by reflecting (actually *refracting*) from layers of gas, hundreds of kilometers above the Earth's surface. The signals bounce off these layers, or regions, because the gases are ionized by the sun's rays. Because of this, their effectiveness depends on the time of day and the time of year. The day-time and summer months are better for the higher frequencies (say, above 10MHz) and night-time and winter are better for the lower frequencies.

Propagation of VHF Radio Signals—VHF signals (above 30 MHz) are less affected by solar activity although at 50 MHz very long distant propagation can occur at a sunspot maxima. Periodically, solar flares on the sun release streams of high energy particles. These particles create auroras (curtains of ionized gas) in polar regions of the earth. An aurora can propagate VHF signals over long distances for periods of a few hours at a time.



Drawing courtesy of DIY Radio

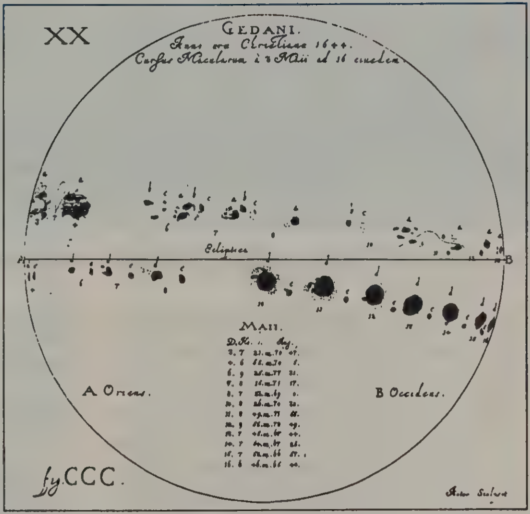
What Are Sunspots? Sunspots are areas of the sun which are less hot (about 3,000 degrees C) than the rest of the sun's surface (about 6000 degrees C) and therefore appear dark. They produce intense radiation which make the ionosphere reflect radio signals. The spots last from a few days to a month or two and the quantity of sunspots is directly related to the effectiveness of the ionosphere in reflecting short-wave signals as can be seen from the graph in Figure 2 (top line—sunspot count; bottom line—effectiveness of ionosphere).



A solar flare is a gigantic flame on the sun's surface which greatly disturbs the ionosphere and affects short-wave radio signals. (Photo courtesy of SESC, Boulder, Colorado, and DIY Radio)

How To View Sunspots Safely—*IMPORTANT WARNING*: Never look at the sun directly through a telescope or binoculars, even with a dark filter added. This can cause permanent severe damage to your eyes! The safe way to look at the sun is by projection. Put a pin hole in a piece of thick cardboard. The image of the sun is then projected onto a piece of white paper. Sunspots should be clearly visible using this method. You can make an "elegant version" of this scheme but putting a large cardboard box (with a pin hole on one side and a white sheet of paper pasted on the other inside surface. After the box is over your head and your eyes dilate (in about three minutes), you will see a fantastic, bright image of the sun.

Where Do They Come From? Sunspots have been observed and recorded for three centuries, ever since Galileo (1564 -1642) turned the newly invented telescope towards the sky.


XX
GEDANI.
Anno æræ Christianæ 1644.
Cursus Macularum à 3 Maii ad 16 eiusdem
Eclipticæ
MAII.
A Oriens.
B Occidens.
fig. CCC.

An early observation of the sun. Johann Hevelius, a wealthy astronomer, constructed the best observatory of his time and made many fine observations of the sun, such as this drawing showing the positions of sunspots over several days in 1644. It took another 200 years of observing the sun before the 11-year cycle was discovered. (Drawing courtesy of Science Museum and DIY Radio)

In the nineteenth century, Dr Rudolf Wolf of the Zurich Observatory corresponded with a number of astronomers forming a network of solar observers. This helped to maintain their records even when the weather made observation impossible in some areas.

The sunspot count tended to depend on the size of the astronomer's telescope (in other words, how big an instrument he could afford) and this resulted in some rivalry and disagreement as to the 'true' number. In order to get over this problem, Dr Wolf multiplied all counts by a factor which took telescope size into account and allowed a figure of 10 times for spot 'groups'. The system is still in use.

Among this network of observers, a German apothecary, called Heinrich Samuel Schwabe, made meticulous observations of the sun for the best part of twenty years and at the end of that time, in 1843, announced that sunspot numbers peaked every ten years.

The effect of this announcement was electrifying. Hundreds of records of past observations were dug up and graphs plotted to see if Schwabe's findings held true. *Figure 1* shows that graph brought up to date. We now accept eleven years as the average time between peaks.

You may ask how does radio fit into all that? Well, it's like this: When Marconi transmitted his famous three dots across the Atlantic from Cornwall, England, to Newfoundland, Canada, in 1901, he proved that radio waves could do something that light waves could not—go around the curvature of the Earth. Radio Amateurs, some twenty years later, proved that short waves were even better for that task than the long waves all professionals were using at that time. Because of this, Amateurs have frequency allocations throughout the short-wave spectrum.

However, one snag with short-waves soon became apparent. Short radio waves rely upon reflection in the ionosphere where the air is extremely thin. Because of this thinness, the ionosphere is strongly influenced by the energy reaching it from the sun. Daylight and darkness have a great effect on this gas, and the time of year affects how much solar energy can reach the ionosphere. Charged atomic particles, ejected by the sun in the "solar wind" can cause magnetic "storms" in the ionosphere. High intensity ultraviolet and X-ray radiation from solar flares can totally block all short-wave communication for perhaps half an hour on the sunlit side of the Earth. This is known as a Dellinger Fade-out. Luckily, flares can also cause parts of the ionosphere temporarily to reflect signals above 100 MHz which would not normally be reflected. This is an effect known as aurora.

It is not surprising that the effectiveness of the ionosphere as a

JUN'S ELECTRONICS

KENWOOD

TS-450S
TS-850S

HF EQUIPMENT

	List	Juns
TS-950SDX Dlx xcvr w/kyer/DSP/filt	$4799.95	Call $
TS-850S 9-band transceiver w/mic	1949.95	Call $
TS-850S/AT 9 band transceiver w/tuner	2149.95	Call $
PS-52 Heavy duty power supply	289.95	Call $
TS-450S 9-band xcvr/SW Rcvr/mic	1439.95	Call $
TS-690S 9-band xcvr w/6m/mic	1699.95	Call $
TS-450S/AT 9-band xcvr/tuner/mic	1639.95	Call $
PS-33 Light duty 20.5A ps	239.95	Call $
PS-53 Heavy duty 22.5A supply	269.95	Call $
SP-23 External speaker	79.95	Call $
TS-50S Super compact HF xvr	1279.95	Call $
AT-50 External automatic tuner	354.95	Call $
TS-60S Super Compact 6M xvr	1209.95	Call $
TS-140S 9-band HF transceiver w/mic	1079.95	Call $

ACCESSORIES

TL-922A 2KW PEP HF linear (3-500Zs)	2099.95	Call $
SM-230 Sta. monitor w/pan; 950/850	1099.95	Call $
AT-300 Ext. auto tuner; 850/450/50	669.95	Call $
DSP-100 Digital signal proc. 450/850	669.95	Call $
SW-2100 1.8-30MHz SWR/pwr meter	164.95	Call $

RECEIVERS

R-5000 100 KHz-30 MHz receiver	1179.95	Call $
DCK-2 DC cable kit w/cig plug	12.95	Call $
R-2000 150 KHz-30MHz digital Rcvr	849.95	Call $
VC-10 118-174 MHz VHF converter	210.95	Call $

TM-241A
TM-742

VHF/UHF

TR-751A 25W 2m SSB/FM w/TTP mic	769.95	Call $
TS-790A 45w 2m/40w 440 SSB/FM xcvr	2149.95	Call $
TM-641A 50w 2m/25w 220 FM xcvr/TTP	929.95	Call $
DTU-2 Digital paging unit	29.95	Call $
PG-4K 13' remote cable kit	51.95	Call $
PG-4L 23' remote cable kit	84.95	Call $
TSU-7 CTCSS decoder unit	55.95	Call $
UT-28S 50w 10 meter unit	339.95	Call $
UT-50S 50w 6 meter unit	339.95	Call $
UT-220S 25w 220 MHz unit	339.95	Call $
UT-1200 10w 1.2 GHz unit	439.95	Call $
TM-742A 50/35w/ 2m/440 FM xcvr w/TTP	929.95	Call $
TM-942A 2m/440/1.2 FM Xcvr/TTP	1279.95	Call $
TM-732A 50/35w 2m/440 FM Xcvr w/TTP	769.95	Call $
TM-251A 50w 2m FM Xcvr w/TTP mic	529.95	Call $
TM-331A 25w 220 FM Xcvr w/TTP mic	519.95	Call $
TM-441A 35w 440 FM Xcvr w/TTP mic	529.95	Call $
TM-541A 10w 1.2GHz FM Xcvr w/TTP mic	649.95	Call $

TH-28
TH-48
TH-78

HANDHELDS

TH-28A 2.5W 2m FM HT/batt/cgr/TTP	399.95	Call $
TH-48A 2W 440 FM HT/batt/cgr/TTP	449.95	Call $
TH-78A 2.5W 2m/440 FM HT/batt/cgr/TTP	599.95	Call $
TH-22AT 3W 2m FM HT	349.95	Call $
TH-42AT 2.5W 440 FM HT	389.95	Call $

1-800-882-1343

FAX 310-390-4393
5563 Sepulveda Blvd.
Culver City, CA 90230

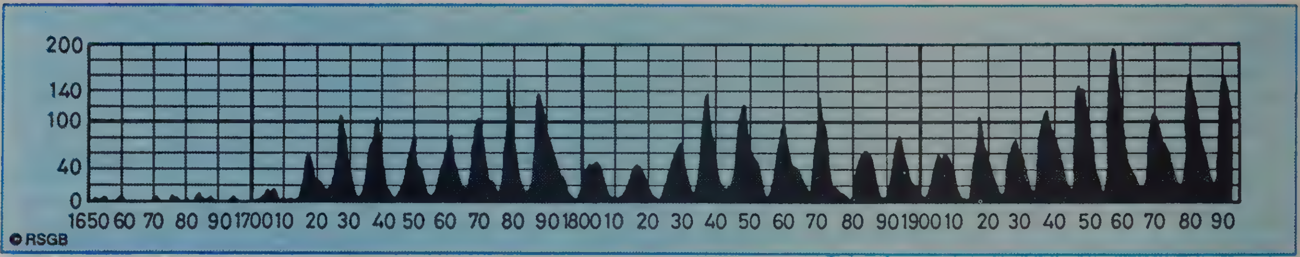


Figure 1—A graph of sunspot numbers for more than 300 years. It allows estimates to be made of the performance of probable future solar cycles.

"mirror in the sky" follows the sunspot number in its eleven year cycle. Since the early thirties of this century, the ionosphere observatory has measured the effectiveness of the ionosphere as a reflector of radio waves, by measuring its height and maximum usable frequency (MUF). A graph of the effectiveness of the ionosphere plotted with a graph of the sunspot number shows the close relationship (see *Figure 2* below).

*73s de Kurt Feldmesser** ❑

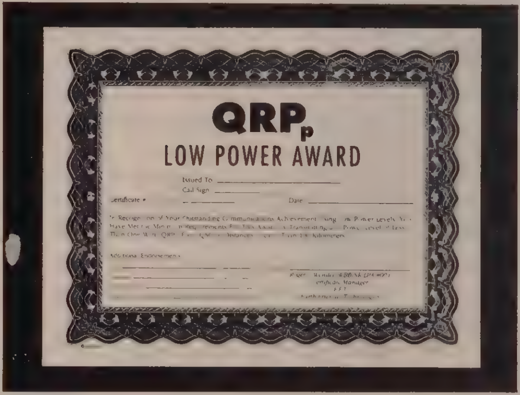
**The author is a member of the Radio Society of Great Britain Propagation Studies Committee*

The National Amateur Radio Association has been granted permission to reproduce material from "*D-I-Y Radio*," an excellent publication from the Radio Society of Great Britian. If you see their logo, shown below, it means the material first appeared in "*D-I-Y Radio*" and is reproduced with permission. For more information on the many excellent RSGB publications, write Radio Society of Great Britian, Lambda House, Cranborne Road, Potters Bar, Herts. EN6 3JE ENGLAND.

D-i-Y RADIO

CAN YOU WORK OVER 100 KILOMETERS WITH LESS THAN ONE WATT?

If you have done so, or think you can, you may be interested in a QRPp Low Power Award being provided by Earth Friendly Technologies. The award (see accompanying photo) is designed to encourage lower power operating and is easy to earn. You need only provide the Certificate Manager (Roger J. Wendell, WB0JNR) with a photocopy of either the station log, or the confirmation QSL card, clearly showing the date, time, mode, and frequency that the qualifying communication took place on.


QRPp
LOW POWER AWARD
Issued To
Call Sign
Certificate #
Date

For more information, and a set of rules, write to EFT Low Power Award, P.O. Box 460101, Aurora, Colorado, 80046-0101.

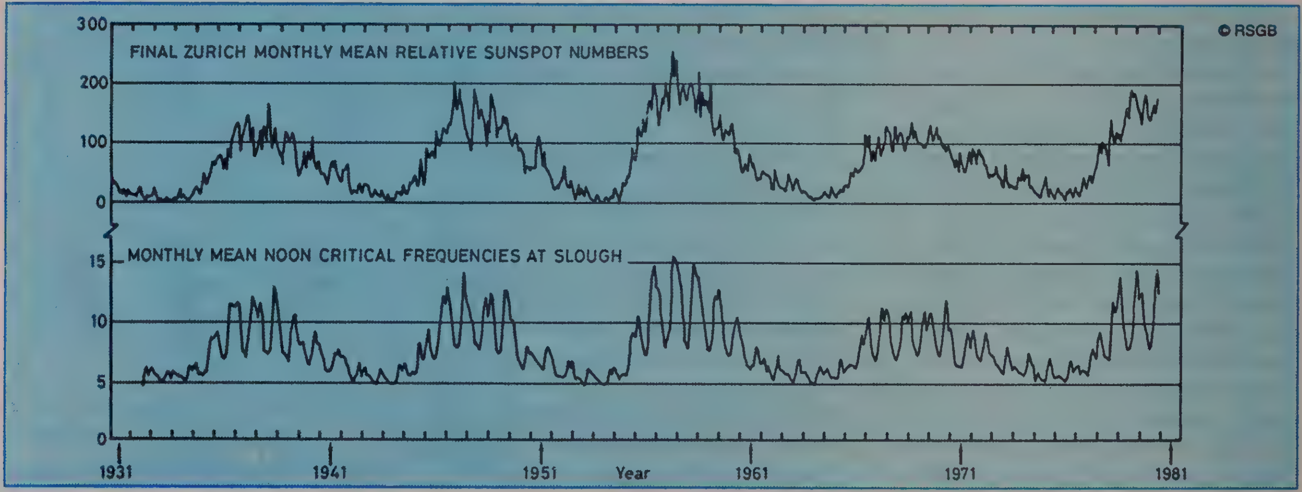
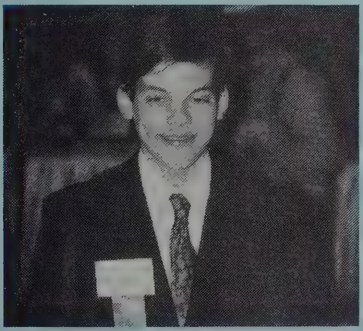


Figure 2—The usefulness of the shortwave (HF) bands (lower graph) follows closely the sunspot count (upper graph). (Data from Rutherford Appleton Laboratory, drawing courtesy of DIY Radio)

HOW FAST THEY GROW!

Remember this young man? If he looks familar it's because you saw Daniel Savio, AA2GM, two years ago on page eight of *How To Earn Your No-Code License*, published by The National Amateur Radio Association.

Daniel stopped by our booth at the 1994 Dayton "Hamvention" to say hello and once again, he was a speaker at the Dayton Youth Forum.



THE PERFECT LOVE AFFAIR

You'll love the performance of the **ALINCO** Dynamic Duo—the DR-130T for base and mobile operation and the fabulous DJ-180T handheld transceiver.

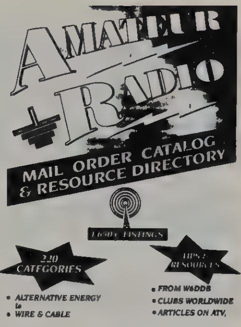
DR-130T-features unexcelled "talk power" with 50 watts output.

DJ-180T-low-cost, full-featured handheld, perfect for beginners.

Most important of all, you'll love the service and prices at:

Radio Depot
2135 Sheridan Rd., Suite F
Bremerton, WA 98310
(206) 377-9067

1994 DIRECTORY TELLS ALL



We didn't think it was possible, but the *1994 Amateur Radio Mail Order Catalog and Resource Directory* is even bigger and better than the past issues. This book is the most comprehensive, accurate source of Amateur Radio vendors and manufacturers ever produced. It contains 216 categories and more than 1,650 listings designed to keep the ham community up-to-date on who's who in ham radio sales. Just take a look at one page of the Table of Contents for a sample of what's available.

You will also find many valuable facts and articles in the *Resource Directory* such as *100 Free Catalogs, Catalogs for a Fee, Radio Clubs, Ham BBSs, New Books, MARS addresses, Worldwide QRP Organizations, International Radio Operating Permits* and several exciting articles that should be of interest to every Amateur Radio operator. You'll also find a wealth of valuable tips for the newcomer and veteran operators.

The 1994 Amateur Radio Mail Order Catalog and Resource Directory (catalog #B660) is available from all major ham radio stores, or it can be ordered directly from the National Amateur Radio Association. The price is $16.95, plus $3.00 shipping and handling. The directory is shipped from stock. ☐

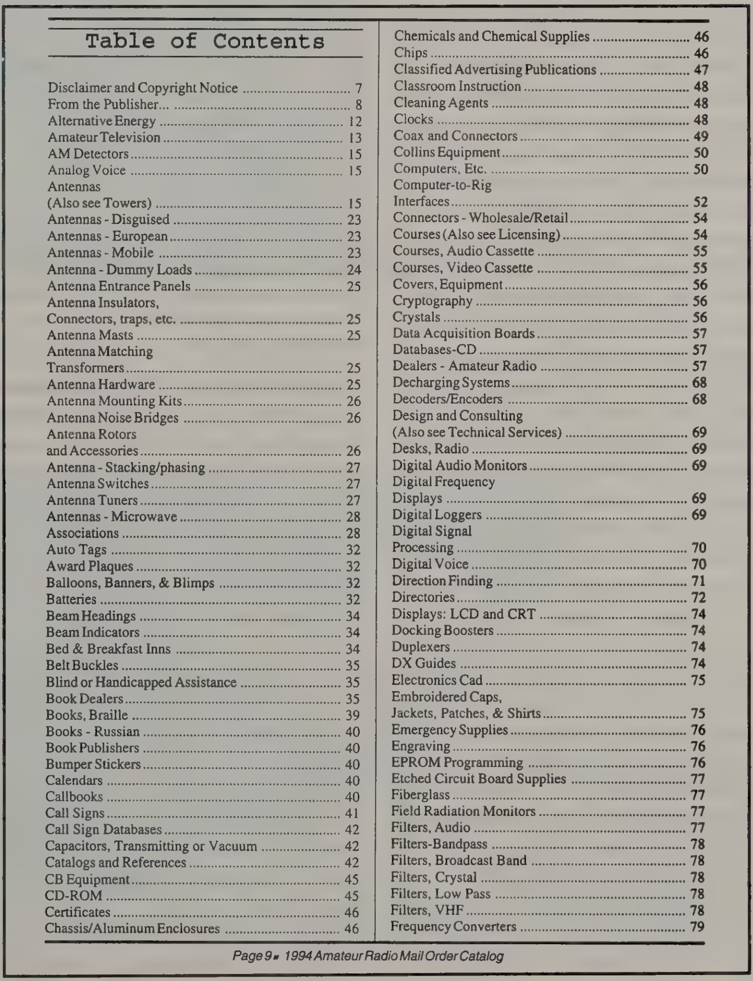


Table of Contents

Disclaimer and Copyright Notice 7
From the Publisher... 8
Alternative Energy 12
Amateur Television 13
AM Detectors 15
Analog Voice 15
Antennas (Also see Towers) 15
Antennas - Disguised 23
Antennas - European 23
Antennas - Mobile 23
Antenna - Dummy Loads 24
Antenna Entrance Panels 25
Antenna Insulators, Connectors, traps, etc. 25
Antenna Masts 25
Antenna Matching Transformers 25
Antenna Hardware 25
Antenna Mounting Kits 26
Antenna Noise Bridges 26
Antenna Rotors and Accessories 26
Antenna - Stacking/phasing 27
Antenna Switches 27
Antenna Tuners 27
Antennas - Microwave 28
Associations 28
Auto Tags 32
Award Plaques 32
Balloons, Banners, & Blimps 32
Batteries 32
Beam Headings 34
Beam Indicators 34
Bed & Breakfast Inns 34
Belt Buckles 35
Blind or Handicapped Assistance 35
Book Dealers 35
Books, Braille 39
Books - Russian 40
Book Publishers 40
Bumper Stickers 40
Calendars 40
Callbooks 40
Call Signs 41
Call Sign Databases 42
Capacitors, Transmitting or Vacuum 42
Catalogs and References 42
CB Equipment 45
CD-ROM 45
Certificates 46
Chassis/Aluminum Enclosures 46
Chemicals and Chemical Supplies 46
Chips 46
Classified Advertising Publications 47
Classroom Instruction 48
Cleaning Agents 48
Clocks 48
Coax and Connectors 49
Collins Equipment 50
Computers, Etc. 50
Computer-to-Rig Interfaces 52
Connectors - Wholesale/Retail 54
Courses (Also see Licensing) 54
Courses, Audio Cassette 55
Courses, Video Cassette 55
Covers, Equipment 56
Cryptography 56
Crystals 56
Data Acquisition Boards 57
Databases-CD 57
Dealers - Amateur Radio 57
Decharging Systems 68
Decoders/Encoders 68
Design and Consulting (Also see Technical Services) 69
Desks, Radio 69
Digital Audio Monitors 69
Digital Frequency Displays 69
Digital Loggers 69
Digital Signal Processing 70
Digital Voice 70
Direction Finding 71
Directories 72
Displays: LCD and CRT 74
Docking Boosters 74
Duplexers 74
DX Guides 74
Electronics Cad 75
Embroidered Caps, Jackets, Patches, & Shirts 75
Emergency Supplies 76
Engraving 76
EPROM Programming 76
Etched Circuit Board Supplies 77
Fiberglass 77
Field Radiation Monitors 77
Filters, Audio 77
Filters-Bandpass 78
Filters, Broadcast Band 78
Filters, Crystal 78
Filters, Low Pass 78
Filters, VHF 78
Frequency Converters 79

Page 9 • 1994 Amateur Radio Mail Order Catalog

NARA Reviews the Cushcraft A270-10S Beam and Grants Award of Amateur Radio Excellence

by NARA Staff

EARLIER THIS year, Cushcraft introduced their dual-band beam antenna for the two-meter and 70 cm bands. It was instantly acclaimed as a "winner." One of the first production antennas went to a NARA member, who called us to gush enthusiastically about his new treasure. We managed to obtain one at Dayton after standing in a long line of buyers at the R&L Electronics booth (an absolute mob scene!).

What's A Beam?—You already know, from the March/April 1994 issue of *The Amateur Radio Communicator*, about the improvement in range when you replace your "rubber duck" with an outside groundplane antenna. But the groundplane radiates a signal in all directions. This was demonstrated dramatically when testing the Comet GP-9 dual-band vertical. We were able to "key up" repeaters in all directions—as many as four on one memorable channel!

If you look down on an antenna from above, and could actually see the radio frequency energy emanating from it, you would be viewing what is called the radiation pattern. Looking down on either the simple groundplane, or the elegant Comet GP-9, would show a completely circular pattern.

You receive all the aluminum parts and stainless steel hardware as shown here. Everything is shipped in a box about one meter long. Even the coaxial feedline harness is included with connectors and waterproof covers.

The radiation pattern of an antenna can be modified by placing other elements near the element to which the coax feedline is connected (the radiator). By adding additional elements to the radiator, the "wasted" energy that goes in unwanted directions, can be redirected.

Strictly speaking, an antenna that redirects the beam of a normally non-directional radiator (like the groundplane) is called a beam antenna. It produces a radiation pattern with most of the transmitted energy concentrated (or beamed) in a particular direction and attenuated in other directions.

The most common form of beam is called the Yagi antenna. This consists of a series of parallel rods fastened to a central support called a boom. The inventor, Dr. Yagi, found that if a metal rod or wire was placed parallel to the driven element (the radiator) and made about five percent longer, it would reflect or redirect the radiation. This element is called the reflector. When another rod, about five percent shorter than the driven element was placed in front, the redirected beam would be even further concentrated. This third element, in front of the radiator, is called the director. The antenna just described would be a three-element beam.

The Cushcraft A270-10S is a five element beam. One of the things which makes it unique, however, is that five elements for both two meters and 70 cm. are mounted on the same boom. Using a common boom does not seem to affect the performance negatively on either band, but it certainly makes the antenna less expensive than two individual antennas. One of the reasons the beam is such a bargain, is you almost get the second band for free. That may not be important at the moment, particularly if you only have a two-meter handheld, but someday you will probably trade up to a dual-band handheld transceiver. Even if you never need 440 operation, the price of the A270-10S is still excellent for a single-band beam.

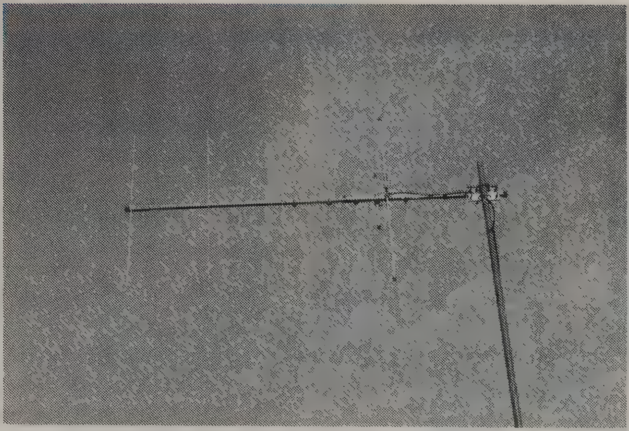
How Does It Work? We tested the A270-10S by comparing it to both the groundplane and the Comet GP-9 dual-band vertical. When compared to the groundplane, the performance was astounding. The difference varied between "in the noise" with the groundplane to almost full quieting with the beam. There were a couple of stations in Tampa (about 20 miles away) that we could not key with the groundplane. We were "somewhat noisy" but perfectly Q5 (very readable) on the beam.

When we compared the beam with the Comet GP-9, the signals were almost the same. One time the Comet seemed slightly stronger and another station reported the beam had the edge. This would seem to indicate that both antennas met their gain specification of slightly more than 8 dB.

One advantage of the Cushcraft A270-10S over either the groundplane or the Comet vertical, is the ability to "null out" a station. One of the characteristics of a beam antenna that I neglected to mention earlier is its null. As you add elements to a beam, an area completely dead to reception appears at right angles to the boom of the antenna. This is called a null. The more elements you add, the deeper the null. Thus, it is possible to rotate the antenna and "null out" a station.

Let's say that from your QTH (location) it is possible to key up two repeaters on the same channel. Simply by rotating the antenna to null repeater A, you can trip the desired repeater B. Even if you are not aimed directly at B, the lack of interference from A allows you to work B interference-free.

We tried from Clearwater to work a repeater in Tampa. With the Comet GP-9 we would also trip another repeater in Sarasota, to the south. The groundplane would not trip either repeater. By aiming the beam slightly off Tampa, we were able to put Sarasota in the null and had perfect communications. The signal strength meter on our Yaesu 736R read S9 when the beam was aimed at Sarasota, but the station was buried in the noise when in the null of the beam.



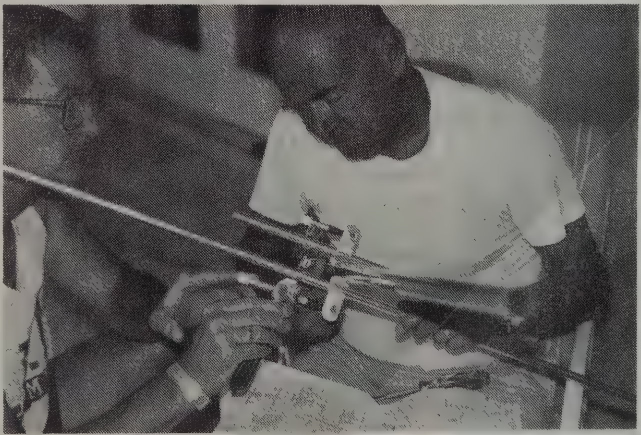
What is more beautiful than a ham radio antenna with a beautiful Florida sky for background?

Construction—The Cushcraft beam is very rugged. Stainless steel hardware is provided and multiple lock washers under the nuts and bolts securing the antenna elements makes it very rugged. Even so this antenna weighs less than two pounds.

It is a "piece of cake" to construct the beam. The instructions have beautiful, clear illustrations. As a test, I let KD4UZT, Tim Heenan, do the complete assembly from unpacking to testing. I checked his work, as shown in the accompanying photo. Even though he had never assembled an antenna before, it was up and operating in just shy of two hours. We were both impressed by the fact that Cushcraft even included plastic end caps for the boom and driven elements. Why? It keeps the antenna from whistling when the wind blows. Little touches like that are found in a "class product."

Satellite Operation—You can hold the antenna in one hand while aiming it at a satellite and holding a rig in your other hand! Talk about a portable satellite station.

One evening, after 20 meters finally shut down around midnight, we decided to try an experiment. Our trusty Alinco DJ-580 was set up to communicate with the Russian RS-14 (AO-21) "RUDAK" satellite (435.016 up and 145.983 down). When the satellite came over about 2a.m., we simply waved the antenna around to peak the



How many NARA members does it take to screw in a driven element? Tim Heenan, KD4UZT, and Don, W6TNS, complete the assembly & checking of the Cushcraft A270-S10 antenna.

signal. When the FM repeater opened, we called CQ twice and a station in Detroit came back (in our excitement, we neglected to write down his call and get a QSL card!). That's not too shabby for either piece of gear! What is that—about 1,400 miles on a handheld?

Conclusion—The Cushcraft A270-10S is an extremely well-made antenna, is very rugged, yet lightweight and very inexpensive. What's inexpensive? The list price is only $99.50 and ham net is somewhat less. I can't be more specific since some stores have very low prices to attract your attention. We paid $64.50 at the Hamvention, but keep in mind this was a show special and you are not likely to find the antenna anywhere at this price until Dayton 1995.

We were so impressed with the antenna that we gave it NARA's Award Of Amateur Radio Excellence. I think you will be as pleased as we were with this product.

73s from NARA Staff ❑

AMATEUR RADIO

AWARD OF

NARA

EXCELLENCE

AWARD OF AMATEUR RADIO EXCELLENCE

The National Amateur Radio Association is pleased to announce another Award of Amateur Radio Excellence.

There are a few products on the market that represent outstanding bargains, or exceptional value, performace and usefulness to beginners. NARA believes these products should be recognized and recommended to our members. Manufacturers who receive the National Amateur Radio Association's Award of Amateur Radio Excellence are permitted to use the award symbol in advertising for that product.

One such product is the A270-10S Dual-Band Yagi from Cushcraft Corporation in Manchester, New Hampshire, which is reviewed in this issue of *The Amateur Radio Communicator*. We believe that this 144/440 MHz beam antenna represents an outstanding bargain based on price/performance criteria. As such, it should be an ideal beam antenna to extend the range of a beginner's handheld radio.

We look to our members to recommend products which, in their opinion, meet the criteria of "outstanding bargain and/or exceptional value, performance and usefulness to beginners." That is precisely how we found out about the A270-10S.

Closed Repeaters

(Continued from page 13)

"approval" or "right stuff" attitudes you suggest. However, I suspect that most closed repeaters are in major markets, where repeater usage is heavy and where there are also other repeaters available. The concept can be and often is to limit access to "paying" members or members of the sponsoring group. Let me reiterate, I do not condone this.

This, however, is where my agreement with your hypothesis ends. You are right, the spectrum belongs to all of us. But, closing a repeater does not preclude use of that portion of the spectrum. The repeater frequency is still there for anyone to use for simplex communications, albeit, when the repeater comes up it will probably be quite unbearable. The user also won't make too many friends among the repeater users.

What closing the repeater is doing is limiting access to the hardware that someone has paid good money for, pays good money to maintain, and, ultimately, is responsible for the manner in which it is used. This alone is justifiable reason for closing the system, whether or not it is in the spirit of Amateur Radio and whether or not it goes against your grain or mine.

Do you then suggest, based on your same premise, that someone who has a two to twenty meter remote base MUST open it to all comers simply because it occupies spectrum when in use and would be in the spirit of Amateur Radio? Or to carry it one (perhaps ridiculous) step further, must anyone owning any piece of hardware (HF rig, VHF rig, on ad infinitum) open its use to all comers? I think not.

I write this, not for the sake of arguing the point, because I don't think it is worth arguing, but because your statements are being read by and influencing many newcomers. The whole point is that the closed repeater operator does have the right, by ownership, of limiting access to his hardware and, therefore services, just as you or I have the right to limit access to any of our equipment. And, no doubt, the reason someone hasn't been sued over it is that property rights are still one of our (few) remaining inalienable rights.

I might also suggest that you devote some space to letting the newcomers know that repeaters do have costs involved and that someone has to pay the bills (you just did that, Frank- ed). It might save them some hard feelings when they begin using a repeater which is owned by a dues supported group. I'm sure they will be told they are expected to support the system if they make regular use of it, but a little education in that direction won't hurt. The treasurer might not be too tactful, unfortunately.

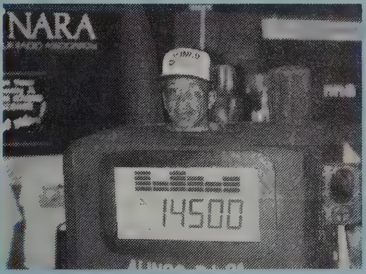
Thanks for letting me spout off. And, by the way, the next time you are in our islands, please feel free to use any of the repeaters here. They are all carrier access.

73, Frank Jaeger, NP2I
St. Croix, VI ❑

HOW TO GET ATTENTION AT YOUR NEXT HAMFEST

Talk About Getting Wrapped Up In Your Hobby

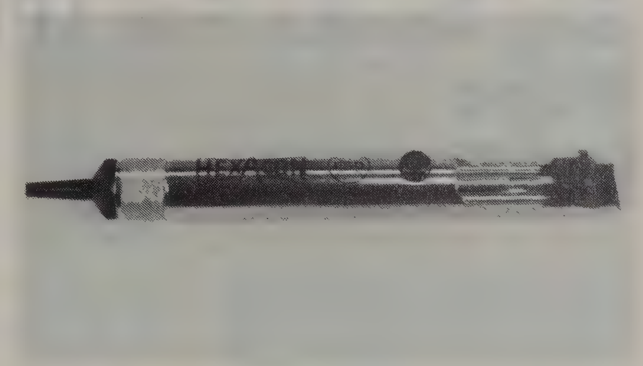
You can imagine our suprise, at the 1994 Dayton "Hamvention," when an Alinco DJ-G1 wandered by our booth. After we recovered from that strange sight, the next eye-popper was our General Manager, Joe Condron chasing after the display yelling "STOP THAT HANDHELD RADIO!" so we could photograph it. This is just one of the wild sights you'll see at Dayton. Will we see you there next year?



FIX YOUR SOLDERING MISTAKES—SLUUURRRP!

Unless you are one of those rare creatures, like our Editor—who never makes a mistake soldering, you need a solder sucker right next to your soldering iron and roll of Kester 60/40 solder.

What's a solder sucker and why do you need one? That's the common name for a "desoldering pump." Let's say you are building a new kit. You slap the solder on the resistor leads and then discover you put it in the wrong pad hole. The Hexacon desoldering pump comes to your rescue. You press the plunger to cock it, then hold the Teflon tip near the solder connection, as you heat the junction with your iron. Then press the release on the side and—sluuurrrp—your mistake is sucked into the aluminum stomach of the desoldering tool.



If you are a "builder" and want to avoid solder frustration, you can pick up the device at your local radio store for approximately $15.00. F or more information, contact The Tool Resource, P.O. Box 116, W. Dundee, Illinois, 60118.

BELT CLIP WON'T RELEASE!

FREE (Almost) QSL CARDS

JUST GETTING STARTED?

Fill out this coupon, and send it to us. You'll receive 25 of your own QSL cards printed on mixed, bright colored card stock!

Call ____________ Phn ____________
Name ______________________
Addr ______________________
City ______________________
State ____________ Zip ____________
County ______________________
ARRL Logo: Yes or No

Please send $2 to cover shipping & handling. Allow 4 wks for delivery. Offer ends **SEPT. 30, 1994!** Only one order per customer please.

Send to: Rusprint
26037 W. 220th Terr.-3NA
Spring Hill, KS 66083
(913) 686-5116

Big Ducks For Li'l Pups

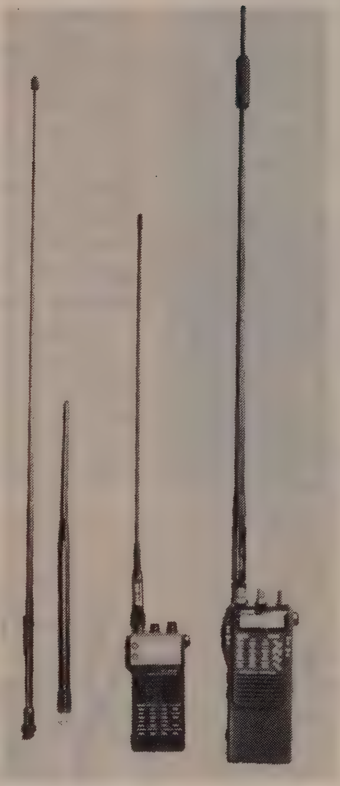
by Dave Ingram, K4TWJ

The stubby antenna supplied with modern FM handhelds is designed for operating convenience rather than maximum range. Switching to a tall duck or pullup antenna lets you hear and talk further. This article explains the details.

DO YOU WISH your handheld FM transceiver had just a touch more "oomph" for reaching fringe area repeaters or talking slightly further on "direct" simplex frequencies? Let's say the idea of instant hamming from a vacation cottage, and the security of knowing your pocket-size rig can be used reliably during emergencies, is super-appealing. Well friends, your answer to both needs (and more!) is a "tall duck" or pullup handheld antenna! These inexpensive delights snap right on your FM handheld, they increase its radiated power, improve reception, and conveniently slip in your pocket for carrying.

Generally speaking, the shorter the antenna, the shorter the handheld's range and the taller the antenna, the greater the handheld's range. The trade-off for more range: tall antennas can be cumbersome in crowded places.

How much of a boost might you realize when using a tall handheld antenna? That depends on the size of your rig's existing/supplied "ducky" antenna and the height of the new tall antenna, but the improvement can generally be described as follows. If your handheld's signal is "quite noisy" into a repeater, changing over to a tall antenna will usually raise it to "almost full quieting." If your rig's signal is only "medium noisy," a taller antenna will make it "full quieting" (perfect copy). A tall antenna will also let you access ("hit") marginal out-of-range repeaters, but your relayed audio may be close to the noise level.



Tall Duck and pull-up antennas are terrific for extending the range of your FM handheld. Two of the most impressive types I have found are Comet's flexible SH-55 tall duck (mounted on left handheld) and Maldol's pull-up AH-210R (mounted on the right handheld).

At this point, I should emphasize every different "ducky" or antenna has its own special purpose in our Amateur radio world. Stubby ducks are easy to carry and good mainly for close-in use. Medium height antennas or "tall ducks" give your rig more range, with a slight trade-off in maneuverability. Taller "pull-up" antennas give your rig the greatest range, but may prove challenging to maneuver in crowded areas (watch that tip, Dave!). Which type best fits your needs depends on your lifestyle. I personally like the medium height jobs for around-town use and the really tall types for vacationing (somehow I always end up staying in a place right on the fringe of two adjacent area repeaters).

So where do you usually find tall duck and pull-up antennas for sale? At all Amateur radio dealers, at hamfests, and they are even advertised right here in the Communicator for easy "800 number" shopping from home. A variety of "tall duck" and "pull-up" antennas are on today's market, but two of the most impressive types I have used are made by Comet and Maldol. Both of these antennas are great range extenders (especially when they help you work through a wide coverage "super repeater."

You can talk 100 miles with your handheld!), and they are terrific traveling companions. You can use them directly on your handheld or snap them onto one of the new style auto window clips for backseat mobiling in the family car or instant mobiling in a rental auto. They are also a barrel of DX fun when used with your handheld atop a high mountain or on the upper floor of a tall building.

Want more leisure time fun ideas for tall antennas? Since they usually handle a rig power level of up to 10 watts and many mobile FM transceivers have a low power output setting of five or 10 watts, combining the two can produce a great "portable radio" for carrying to the beach. Just add a BNC-to-PL-259 adapter and a PL-259-to-PL-259 right angle adapter between the antenna and transceiver and swing the antenna upright. Add a 12-volt lantern battery for powering the rig, and strap everything together, include a top carry handle and side mike hanger, and you have the hottest portable imaginable! I will leave mechanical assembly details of that setup to your ingenuity and invite you to send a photo of your "brain child" to NARA for inclusion (and recognition of your accomplishment!) in a future issue of the *Communicator*.

> My personal vote for favorite "pull-up" antenna is Maldol's AH-210R, and favorite "tall duck" is Comet's SH-55.

My personal vote for favorite "pull-up" antenna is Maldol's AH-210R, and favorite "tall duck" is Comet's SH-55. The Maldol model AH-21OR has 3 dB of signal gain on two meters and 5.5 dB gain on 70 cm. When fully extended, it is 36 inches tall. When retracted for carrying, it is nine inches tall. This antenna is a real little tiger! The Comet SH-55 is 15.5 inches tall, flexible rather than retractable, and has 1.5 dB gain on two meters and 3.2 dB gain on 70 cm. It is a gem! Moving up from the "noisy signal syndrome" commonly associated with a handheld and stubby antenna in a fringe area is quick, easy, and low in cost, so why postpone improvement. Get talking with your own tall duck or pull-up antenna today. You will love the results!

73, Dave, K4TWJ ❑

DYNAMITE PERFORMANCE FROM YOUR 2m/70cm RIG!

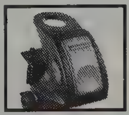
2m/70cm Mobile Antennas

ARD-10B

Whether your transceiver runs 5 or 50 watts, using a Maldol ARD-10 (chrome finish) or ARD-10B (black finish) ensures the maximum communications range for available power. The ARD series is excellent for both in-city use among the buildings and freeway use where lower angle radiation gives longer range. The ARD-10/ARD-10B stands 35" tall, features a 1/2-wave radiator to double signal strength on 2m, and two 5/8-wave sections to quadruple its signal strength on 70cm. ARD antennas are ready to install, and built to last.

Tilt-Over Trunk Mount

The most exciting mount available! Clamps on trunk lid, adjusts to various angles, and includes fantastic tilt-over feature with one-push position lock. Rubberized no-mar pad on base protects auto's finish.



AM-02B

Plug-N-Play Cable Set

Mating cable set has preinstalled antenna base connector/support on one end and PL-259 on other end. Just bolt antenna end in mount, route cable through trunk area to auto's interior, and plug into transceiver. A complete and ready to install package!

NL Cable

Maldol

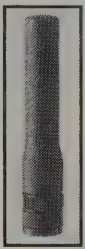
"OLDEST" NEW NAME ON THE AIR
AMERICAN SERVICE
AMERICAN MANAGEMENT
JAPAN'S OLDEST ANTENNA MANUFACTURER

Great Handheld Antennas

Want dynamite performance from your FM handheld? Snap on a 36" tall Maldo AH-210R pull-up antenna and work through fringe area repeaters with ease. The AH-210R retract to only 9" for carrying and extends to produce a 1/2-wave gain antenna for 2 meters. It also has two 5/8-wave sections for quadruple gain on 70cm. You will love the AH-210R!

Headed to a hamfest or crowded area? Switch over to Maldol's ultra-short AH-209S and move around freely while talking with nearby friends. The AH-209S is only 2.8" tall and really makes your talkie compact!

Want to go mobile? Get the Minimag BNC mag mount and use your handheld antenna on this roof-top mount with your HT inside the car.



AH-209S

AH-210R

Maldol USA Sales Office
4711 N.E. 50th Street
Seattle, WA 98105

AnswerFax: 206-525-1896
Fax: 206-524-7826
E-Mail: MALDOLUS@connected.com
Prodigy: VJSH80A

Available from
Dealers Nationwide

LETTERS

INSTANT LICENSING

Dear Don:

I would like to comment on your proposal on the "Instant License" question. I read the article in the March/April issue of the Communicator, and find that I can not agree with your proposal on two counts. I don't think an'instant license' would be in the best interest of Amateur Radio, and your proposal for VEC's to obtain a special "WZ" call sign block of calls would only result in confusion, and more'bootleg'calls on the air.

With the current license term of ten years, a wait of a few weeks is not unreasonable! If waiting a few weeks will cause a loss of interest by the new licensee, then that licensee sure didn't want to be a ham very much, did he/she? I think the loss of such a person is not a serious loss to the hobby. If a person isn't willing to wait for his/her license, it would seem to me that that person doesn't think very much of the hobby. That's all we need, more people who couldn't care less.

Issuing a block of call signs to a VEC so that they can be reissued to people who have passed their tests, seems to be one of the duties of the FCC. Does NARA want to assume the duties of the FCC? Does NARA also want to assume the responsibilities of the FCC, too? I don't think so. I also don't think the various VECs can/would handle the responsibility associated with issuing temporary licenses. How would they handle an operator 'bootlegging' one of the "WZ" calls? How would they know they were 'bootleggers'? How would the FCC know they were legal or not?

This whole issue of 'instant licensing' seems to be a pacifier to people who just can't wait for something they want. That lack of patience is a character flaw, and should be corrected. Or, I guess they could just throw a tantrum and get their way, huh? Why do people go out of their way to 'cure' a problem that really isn't a problem?

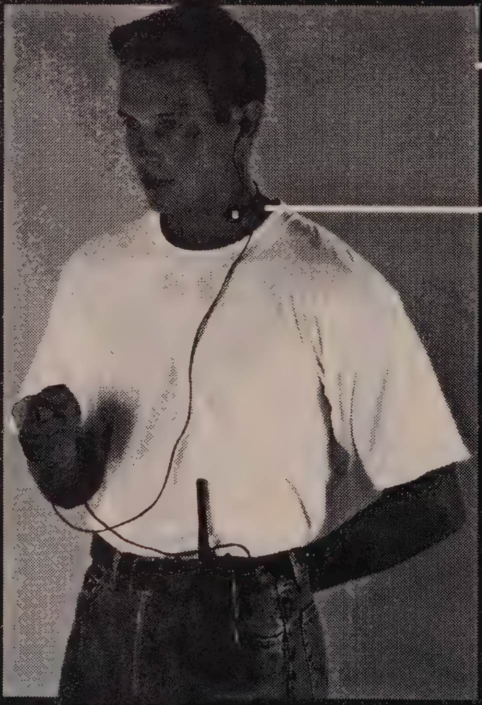
73, Paul M. Lalli, AA5AN

I just love it when someone disagrees with me and clearly doesn't know what they are talking about. Apparently, Paul, you did not read what I had written since what you describe is a proposal by Fred Maia, W5YI. When you parrot the League line, you should get your facts straight. NARA did not suggest issuing blocks of calls to the VEC but, rather, they proposed the FCC would issue a distinctive WZ call to each requesting VE team. They, in turn, would be permitted to allow the successful applicant to use this call with a suffix number. The number would be shown on the manifest sent by the VE to the VEC so that improper operators could easily be identified by the FCC, should this become necessary. To suggest this would increase "bootlegging" is a propaganda hairball coughed up by those who oppose "instant licensing" and lovingly embraced by those who feel "I had to wait for my license, so should everyone else." Certainly people can wait up to 14 weeks for their treasured call letters to be issued, but why should they be forced to do so when there is a better way?

HELP VIA REPEATERS

Dear Don:

I am a new member to ham radio, I got into it because I could be of help to the community. I also thought while traveling it would be faster than using a CB. I am now having second thoughts that maybe the dealer is right—the cellular phone is best. In early April we where passing through Perry, Georgia, and we were in need of a veterinarian for my dog. We had called the vet and he gave us directions. But being a stranger in town, I missed a turn. I got on my radio and called for help on three or four different frequencies without any reply. It was



CONTACT YOUR FAVORITE DEALER

THROAT MIC WITH EARPIECE

EXCELLENT VOICE REPRODUCTION
DOES NOT PICK UP BACKGROUND NOISE

MODEL T-05
YAESU, ICOM, ALINCO
MODEL T-05K
KENWOOD

CALL FOR DEALER INFORMATION

GENESYS

GENESYS PRODUCTS GROUP, LTD.
5730 MOBUD SAN ANTONIO TEXAS 78238
TEL (210) 521-6868 FAX (210) 647-8007

around 9 or 9:30p.m. and we stopped at a motel to ask for directions. Thank God the motel owner knew where the vet was and helped us. I feel the same as you that Amateurs have a serious problem in this regard.

73 Virgil E. Applegate, N0ZUM

Dear Don:

Thank you for the complimentary copy of the *Amateur Radio Communicator*. I wish to comment on your opinion "Is It Time For A Repeater Revolution?" (March/April 1994, pp. 2-3). As a condition to my entering the hobby of Amateur Radio earlier this year, I bargained that my XYL could have a cellular phone. I tried the same arguments as you suggest to get her to go the ham route with me, but no luck. So we took a weekend trip — trusty HT and repeater directory on one side of the car, phone on the other, and roof bristling with antennas. Sure enough, there was a serious road hazard (a truck lost some cargo on the interstate) 60 miles from the nearest major population center. Ham radio was powerless (I never got an answer on any frequency I tried — not knowing if I was even within range, or if anyone was ever listening) while 911 worked just fine on the "expensive and less fun" device. I got the big I-told-you-so look. The air traffic control network (worldwide) sets aside frequencies 121.5 MHz VHF and 243.0 MHz UHF as emergency, "guard" channels. Any aircraft almost anywhere in the world can raise help by calling on those frequencies from ground stations who are required to monitor them. While we cannot hire people to sit and listen continuously, could we not do this: (1) set aside specific emergency (duplex) calling frequencies in each band, (2) require all repeaters to have a separate receiver monitoring that frequency, (3) have the repeaters retransmit the emergency call on their own frequencies, with an identifying alert tone, over-riding other conversations, and (4) arrange for the repeaters to come back to the emergency caller (on the emergency offset) when an answering ham keys in a (universally known) responding code. With linked repeaters, these additional units need not be powerful or expensive. While not absolutely guaranteeing a response, the increased rate for getting help with a system like this should bring credit to our service.

73, Howard E. Evans II, KB8RDL

That might work, Howard, but there is another idea that is gaining popularity. As you probably know, 146.52 MHz is the national calling frequency for two meters. It has been suggested that public-spirited hams install simplex repeaters on this frequency with specific Touch-Tone frequencies allocated to activate the repeater, dial the local police or highway patrol, or even connect to 911. Normal simplex activity on the channel would not activate the emergency repeater. I think it is a great idea and I'd like to see it gain in acceptance.

TO: Don Stoner, W6TNS
National Amateur Radio Assoc.

Join The Dialog!
Write to us at NARA
P.O. Box 201407 Arlington, TX 76006

ADVERTISER'S INDEX

Alinco Electronics, Inc.	Cvr II
Brownville Sales Co.	13
Buckmaster Publishing	9
Doc's Communications	3
GENESYS Products Group, Ltd.	28
Hardin Electronics	5
Jun's Electronics	19
Kenwood USA	Cvr IV
Maldol	27
Media Mentors, Inc.	5
NCC Companies (Comet Antennas)	7
OPCOELECTRONICS	Cvr III
Radio Depot	21
Rosewood	29
Rusprint	25

NEW HAMS-SWL'S-OLD TIMERS

TIME TO HIT THE BOOKS AND BARGAINS!

Rosewood Co. stocks over 200 titles from **ARRL, NARA, CQ, AMECO, W5YI** Group, Universal Radio, Callbook and many others. We have study guides, antenna books, callbooks, repeater directories, modification manuals, software and even video courses. Rosewood has it all!

FAST FREE Delivery

ROSEWOOD

Rosewood Company
P.O. Box 229
Elko, SC 29826
(803) 266-4759 (For General Inquiries)

1-800-875-7762
CALL OUR ORDER LINE TODAY!
Ask for Kathleen, KB4HWC or Ray, WA4OMM, for same-day service.

MasterCard VISA DISCOVER

AVAILABLE FROM NARA

Pass the New Codeless Technician Test—Guaranteed!

Everything you need to pass the new codeless Technician Class exam! The **NARA Codeless Technician Package** includes:

- *How To Earn Your No-Code Ham License,* the 200+page study guide that guarantees you'll pass the test or your money back!
- HamWare software for testing your knowledge
- Latest FCC Part 97 Rules book
- Bonus Morse code training program (IBM) 0 to 25wpm

The NARA Codeless Technician Package (IBM) is just $29.95 (3.00 S&H) #P110.

Introduction to QRP!

NARA does it again with its ***How To Get Started in QRP*** book. QRP (meaning low-power operation using five watts or less) offers a unique and exciting challenge for today's ham. Written by Dave Ingram, K4TWJ, "*QRP*" covers an overview of QRP, accessories, operating tips, power sources, homebrew, clubs, awards and more. With today's technology and equipment, working the world with QRP could be the ultimate challenge! ***How To Get Started in QRP*** is available at all major Amateur Radio dealers or directly from NARA for only **$9.95 ($2.00 S&H)** #B690.

NEW!

Amateur Radio Mail Order Catalog And Resource Directory

The ***Amateur Radio Mail Order Catalog And Resource Directory*** is the most important book you can have in your hamshack! Tells you where to find parts, equipment, kits, QSL cards—everything you need as an Amateur. Features 216 categories and 1,650-plus listings,100 free catalogs, radio clubs, BBSs, MARS addresses, QRP groups, international radio operating permits, informative articles and much more! **The 1994 Directory, with 260 pages is only $16.95 ($3.00 S&H)** #B660

HamWare™ Testing Software

The **HamWare,** IBM compatible (5¼" and 3½" disks) testing software, provides all the practice you need to get your first license or to upgrade. Drawings and diagrams appear automatically on screen along with the appropriate questions, and there's even a practice mode, complete with hints, answers and help screens. There's even a handy on-screen scientific calculator. Your choices are mouse or keyboard selectable. As a bonus, each disk includes a copy of **Morse** software for learning Morse code.

- HamWare Nov/Tech Classes w/Morse #S210
- HamWare General Class w/Morse #S211
- HamWare Advanced Class w/Morse #S212
- HamWare Extra Class w/Morse #S213

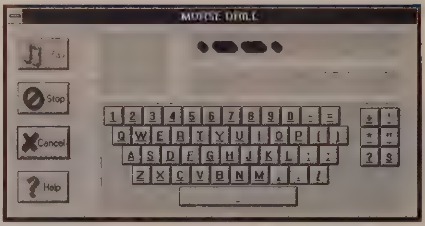
HamWare is available at Amateur Radio dealers or directly from NARA. License classes are sold individually. Each class is only **$14.95 ($2.00 S&H).**

NARA Amateur Training Package

Start with your Novice or no-code Technician license and go "all the way" to Extra class with this excellent IBM compatible training package that includes:

- HamWare Novice/Technician Classes w/Morse
- HamWare General Class w/Morse
- HamWare Advanced Class w/Morse
- HamWare Extra Class w/Morse
- 60-page *FCC Rules and Regulations, Part 97*

Save by ordering the **NARA Amateur Training Package.** This entire package (5¼" and 3½" disks) is only **$32.95 ($3.00 S&H)** #S220.



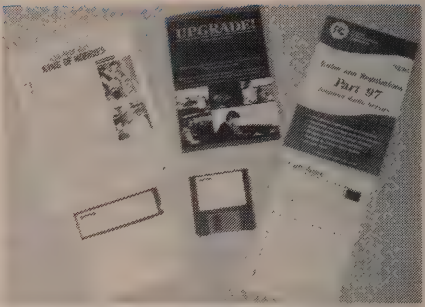
NUMORSE For Windows

The most advanced Morse code training and testing program presently available. NUMORSE teaches all characters, including pro-signs, and tests you up to 40 WPM. Keyboard screen shows character, plus dits and dahs—keys even "move." Soundblaster support, makes perfect audio tapes. Adjustment buttons for all parameters. Includes filter to select characters sent in tests. Sends disk files you compose and even keys transmitter! Extensive HELP file on-line (3 1/2" disk). **NUMORSE For Windows is only $24.95 ($1.50 S&H)** #S411.

The Art And Skill Of Radio-Telegraphy

If you like CW, this software book with 28 chapters is for you! The most complete work on telegraphy codes ever produced—compiled over 20 years by William Pierpont, N0HFF. Not a training or testing program. Describes the history, development and methodology of telegraphy. Menu selection permits printing of on-screen text.

***The Art And Skill Of Radio Telegraphy* is priced at only $9.95** at all major Amateur Radio stores or order direct from NARA ($1.00 S&H).



Upgrade to a Higher Class License with NARA Packages

NARA has put together the essential tools you'll need to upgrade to a higher license class, all in one package. This value-packed offer includes:

- Study Manual by Gordon West, WB6NOA
- Hamware IBM (5-1/4 and 3-1/2" disks) testing software with Morse.
- Latest Part 97 Rules book

#P250—General Class Upgrade Package
#P260—Advanced Class Upgrade Package
#P270—Extra Class Upgrade Package

NARA Upgrade Packages are priced at only $29.95 ($3.00 S&H).

NEW!

How To Get Started In Amateur Radio

This new series by NARA provides basic information needed by all new Amateurs. Many aspects of Amateur Radio are explained in simple, easy-to-understand language.

#B701—*Understanding Your Handheld Radio* - Learn things about your handheld radio the instruction manual for to mention. This "mini-book" completes your knowledge of controls, switches, antennas, specifications and accessories.

#B702—*A Beginners Guide to FM And Repeaters* by Bill Pasternak (WA6ITF) fills in your knowledge on operation on repeaters, proper etiquette, your first QSO, and many other details.

#B703—*The FCC Rules and Regulations- Part 97*, covers the guidelines and rules of the Amateur Radio service. Updated frequently to provide the latest information on every license class. Every ham should have this resource in their station.

#B704—*Understanding Single Sideband (SSB)*- Provides a basic understanding of how this popular mode works. Novices and Tech-Plus hams, who operate 10 meters voice, will like this simplified theory book.

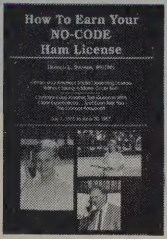
#B705—*Basic Theory For Beginners*- Explains how the five basic electronic components function and what happens when you connect them together. Want more technical knowledge? This simplified theory book provides it!

#B706—*Understanding Packet Radio*- Want to get active on packet? This booklet will provide the basics of this interesting mode. A great primer before you read *Packet Radio For Beginners.*

All *How To Get Started in Amateur Radio* booklets are priced at **$3.95 ($1.00 S&H).**

For The Fastest Service, Call NARA At 1-800-GOT-2-HAM (1-800-468-2426)

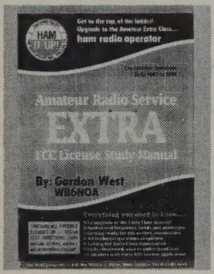
AVAILABLE FROM NARA



How To Earn Your No-Code Ham License

By Don Stoner, W6TNS, is the leading book for anyone wishing to earn the new code-free Tech license. Includes every question plus the multiple-choice answers.

How To Earn Your No-Code Ham License is the only test manual that includes simple and easy-to-understand theory along with many photos and illustrations. There are nine chapters covering each subelement. Test questions are given at the end of every chapter with a list of correct answers at the back of the book. Guaranteed to provide all the information needed to get your ham radio license or your money will be refunded. ***How To Earn Your No-Code Ham License*** is only **$9.95 ($2.00 S&H)** #B610.

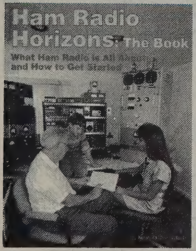


Gordon West Upgrades

Upgrading to a higher license class permits access to even greater portions of the high frequency spectrum and Gordon West, WB6NOA, makes it easy. Each study manual provides the exact examination questions and answers, with an explanation of the correct answers, tips for increasing code speed, helpful study hints and even an FCC form 610. Get ready to upgrade with:

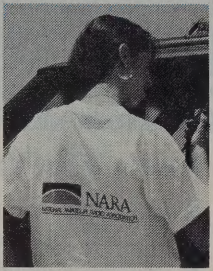
#B830—General Class Study Manual
#B840—Advanced Class Study Manual
#B850—Amateur Extra Class Study Manual

Study manuals are priced at $9.95 ($2.00 S&H).


Ham Radio Horizons The Book
What Ham Radio is All About and How to Get Started

Need Help Starting?

Ham Radio Horizons explains what ham radio is all about and tells you how to get started. HRH opens your door to the fun and excitement Amateur Radio, from talking to friends across town to making new friends in other countries—it's full of tips from expert hams on DXing, contests, serving the public, ham radio in space, digital communications—you name it. ***Ham Radio Horizons* is only $12.95 ($2.00 S&H).** #B930



Wear A NARA T-Shirt!

Come out of the closet! Announce to the world you are a ham radio operator. Impress your friends at the next club meeting. The NARA T-shirt is printed on the front on back.. These T-shirts are top quality, preshrunk100% cotton. Available in M, L and XL, equivalent to S, M and L in preshrunk (specify size). Five designs:

#C200—*NARA LOGO* ($2.00 member discount)
#C210—*DX IS*
#C220— *TRANSMIT THEREFORE I AM*
#C230—*THERE'S NO WAVES LIKE SHORT WAVES*
#C240—*AMATEUR RADIO SPANS THE GLOVE*

NARA T-shirts are priced at $16.95 ($2.00 S&H).

Play It Up! With the Latest Ham Radio Videotapes

Getting Started in VHF. Introduces newcomers and oldtimers to this fascinating part of the radio spectrum—filled with practical advice and information the VHFer needs, and shows you how to have even more fun on VHF. **Only $19.95 ($3.00 S&H).** #V580

Ham Radio Horizons. Full of tips from expert hams on DXing, contesting, space and digital communications. Get in on the excitement of ham radio. **Only $19.95 ($3.00 S&H).** #V590

Getting Started In Ham Radio. Covers the early stages of ham radio including station layouts, safety, choosing and setting up equipment and repeaters. **Only $19.95 ($3.00 S&H).** #V510

Getting Started On Amateur Satellites. A "how-to" guide for the newcomer wanting to work the world through Amateur satellites. Discusses equipment, DXing and more. **$19.95 ($3.00 S&H).** #V520

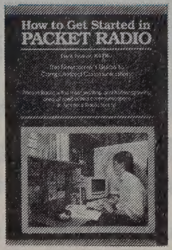
Getting Started in Packet Radio. A "how-to" guide to setting up a computer-to-computer station, getting on the air, QSOs, and operating packet effectively. **Only $19.95 ($3.00 S&H).** #V530

Getting Started in DXing. Successful DXers offer their tips on getting started, proper operating skills, snaring the rare ones, basic equipment and more. **Only $19.95 ($3.00 S&H).** #V540

Reading, 'Riting and Radio! Great for teachers and instructors, educator Carole Perry, WB2MGP, with her students and ham radio classes for children shows how beneficial and exciting ham radio is in school for teaching geography, world affairs, current events, math and more. **Only $19.95 ($3.00 S&H). #V550**

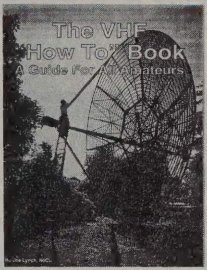
CQ Field Day! Everything from setting up to packing up an outdoor radio station, and what to do inbetween. **Only $19.95 ($3.00 S&H).** #V560

NEW!



Packet Radio For Beginners

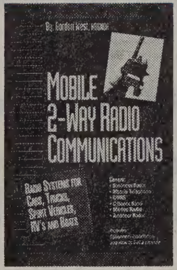
NARA has done it again with ***How To Get Started In Packet Radio*** written by well-known author Dave Ingram, K4TWJ. This informative new book explains the practical side of packet radio in a simple-to-understand manner. It begins with a non-technical description of packet radio, followed by chapters including *Getting Started, Setting Up Your Station, Operating Packet to Networking* and *HF Operation.* There is even a *Packet Radio Equipment Survey* and an appendix that includes circuits for interfacing equipment! Get ***How To Get Started in Packet Radio* today for only $9.95 ($2.00 S&H).** #B670



A VHF Guide For All Amateurs

The VHF "How To" Book is a total resource for all hams but is particularly useful to newcomers. The book tells all about antennas, repeaters, satellite operation, packet, Amateur TV, propagation, contesti-ng and much more. This book even provides club and newsletter information, along with other sources of information. You won't be disappointed with this 124-page book—hot off the press.

***The VHF "How To" Book* is priced at only $15.95 ($3.00 S&H).** #B950


By Gordon West, WB6NOA
MOBILE 2-WAY RADIO COMMUNICATIONS
Radio Systems for Cars, Trucks, Sport Vehicles, RV's and Boats

Mobile 2-Way Radio Communications

Covers other communications systems in addition to ham radio. Includes information, charts, frequency listings, plus information on Marine, CB, cellular telephone, Amateur and business radio. Explains equipment installation, licensing requirements in Gordon West's easy-to-understand and breezy style. This 128-page book should be in everyone's library! *M2WRC* is priced at only $7.95 ($1.50 S&H).

For The Fastest Service, Call NARA At 1-800-GOT-2-HAM (1-800-468-2426)

Form of Payment MC___VISA_____Check____
Please Print
Name ______________________________
Call Sign (Optional) ______________________
Address ____________________________
City ______________________________
State ___________ ZIP _________________
Daytime Phone (________) ______________
MC/VISA __________________________
_____________ Expires _______________
Signature __________________________

National Amateur Radio Association
P.O. Box 201407
Arlington, TX 76006

Here's my order. **J/A**
Don't forget to mail my **FREE** issue of ***The Amateur Radio Communicator!***

Qty.	Item No.	Description	Price	S&H	Total Price
				Subtotal	
				Texas residents must add 7.75% tax	
				Total Enclosed	

Please make your check or money order made payable to: **National Amateur Radio Association**

NARA Is The *Only* National Organization
exclusively devoted to
Novice and Technician Class Amateurs!

Who Is The National Amateur Radio Association?

NARA is striving to publicize Amateur Radio to the general public, attract young people to the Amateur Radio Service, increase the stature and benefits of the Novice and Technician class license and save the various Amateur bands from confiscation by commercial interests.

Recently, Amateur Radio lost part of the 220-MHz band and, in some areas of the country, is in the process of *losing access* to another band (900 MHz).

We must get more people involved in the Amateur Radio Service so we can increase activity and retain our remaining Amateur bands.

NARA brings you an exciting future as an Amateur Radio operator!

Who Should Belong to the National Amateur Radio Association?

- Anyone interested in obtaining an Amateur Radio license
- New Amateur Radio operators of all classes
- Public and private school teachers who want to introduce their students to Amateur Radio
- Beginning Novice and Technician class Amateurs
- Elmers who want to assist beginners
- All Amateurs concerned about the future of the Amateur Radio Service

What Will You Gain when You Join NARA?

1. Knowledge to help you get the most from the Amateur Radio Service
2. You will insure a solid future for the Amateur Radio Service
3. You will be helping others become involved in Amateur Radio
4. Plus you receive our member journal, *The Amateur Radio Communicator!*

Join the National Amateur Radio Association and receive *The Amateur Radio Communicator!*

Here's What You'll Find in the *Communicator!*

- Colorful editorials by Don Stoner, W6TNS
- The electronic adventures of Dan and Burke
- Satellite communications
- Transmitter hunting
- Help passing your Novice or Tech exam
- Erecting your first antenna, propagation
- Types of Amateur Communication
- Pictures and news about other Novices and Technicians...The Future of Our Hobby
- Hot Tips—News you need as an Amateur
- Current information on the VE program
- Repercussions that regulation changes will have on the future of Amateur Radio

When you join NARA, your membership dollars will be used to ***further these goals***. Let's face it—with a membership cost of only $10.00 per year, ***you won't find a better value in Amateur Radio!!!*** Join today! It's easy. Just complete the subscription form below and mail your check or money order. For the fastest service, call 1-800-GOT-2-HAM(1-800-468-2426) with your Visa or MasterCard number.

Yes!

NARA
NATIONAL AMATEUR RADIO ASSOCIATION
P.O. Box 201407
Arlington, TX 76006

I want to join NARA and receive my bimonthly subscription to *The Amateur Radio Communicator.*

☐ One year for $10.00
☐ Two years for $18.00
☐ Three years for $25.00

(Please print _____ Form of Payment MC ___ VISA ___ Check_____

Name ____________________ Call __________

Address ______________________________

City ______________________________

State ______________ ZIP ______________

MC\VISA ______________ Expires __________

Signature ______________________________

Please make your check or money order made payable to:

National Amateur Radio Association J/A

HOW DID I GET THIS MAGAZINE?

ONE OF THE WAYS WE CAN TELL THE WORLD ABOUT the goals and ambitions of the National Amateur Radio Association is to supply complimentary copies. We send about 10,000 pieces to newly licensed hams. This magazine is also mailed to a select list of people who might be interested in becoming Amateurs. We also send approximately 10,000 copies to NARA members and prominent people in Amateur Radio.

If your mailing label does not include a NARA membership number, this may be your last or only copy of *The Amateur Radio Communicator*. We would like to continue providing you with this informative publication, but we can only do so if you are a member of NARA. For those interested in becoming a ham, or who are newly licensed, a membership in NARA represents an outstanding bargain. A membership, which includes a subscription to *The Amateur Radio Communicator*, is only $10.00 per year.

Check the mailing label for your membership number. If you don't see one, look at the NARA advertisement and read the benefits of becoming a member of this fast-growing organization. We need your support and so does ham radio. Help us get it "going and growing!"

LIGHTS OUT!!

OPTOELECTRONICS turns out the lights on LED Counters...

...with the new 10 digit LCD MiniCounter.
More PERFORMANCE
In a SMALLER package

- 1 MHz - 2.8GHz Frequency Range
- Direct Count Range From 1MHz to 250MHz with 1Hz/Sec high resolution display.
- Prescaled Range from 10MHz to 2.8GHz for virtually all two way communications
- Select up to 6 Gate/Measurement Periods
- 10MHz Industry Standard Time Base
- Ultra Compact – true pocket size
- Maximized sensitivity for picking up radio transmissions from the greatest distance
- Display Hold Switch Locks current Measurement

The New Model 3300 MiniCounter breaks the LED counter tradition. From our first Model FC50 (1976) to our latest Model 2300, we have always had quality LED counters. But LEDs are power hungry, failure prone and unreadable in sun light. So the LED counter has now gone the way of the LED wristwatch—replaced by LCD. The LCD advantages include lower power, better reliability, smaller package, more information displayed and better viewing characteristics.

Introductory Price
$129.00
MADE IN THE USA

ACTUAL SIZE!
(Actual Size Hand!)

Model M1 & 3000A Hottest on the Market with: **Digital Filtering** for the fastest method to reduce false counts–no loss of sensitivity & **Digital Auto Capture** that auto holds and stores – working even near strong RF fields!

- **3000A-Multifunction HandiCounter®**
  - 15 gate times selectable • 7 hrs. Batt. life
- **M1-Full Range HandiCounter®**
  - 10 Gate times • 6 hrs. Battery life

Both offer:

- OE10 Ultra Fast & Reliable Counter IC
- Standard Backlit 10 digit LCD Display
- 16 Segment Signal Strength Bargraph
- 3 Data Storage Registers
- 1.3% of a second Measurement Rate
- 1Hz Resolution in 1 Sec. up to 250MHz
- 2 Wire Serial Output for Data Logging

3000A ....**$329.**
M1 ....**$229.**

OPTOELECTRONICS

TOLL FREE ORDER LINE
1-800-327-5912
305-771-2050 • FAX 305-771-2052
5821 NE 14th Ave, Ft. Laud., FL 33334
5% Ship/Handling (Min $5 & Max $10) U.S. & Canada.
15% outside continental U.S.
Visa, Master Card, C.O.D., Cash or Money Order only.

Kenwood's TH-22AT/42AT: The Compact Solution!
144 MHz/450 MHz single band HTs

More Power !

Features

- 3-watt output from MOS FET power module and supplied 6-volt battery (TH-22AT: approx. 3 watts, TH-42AT: approx. 2.5 watts), and 5-watt output with optional PB-34!
- Compact design: 2-3/16 x 4-5/8 x 1 in.
- Built-in DTMF keypad with monitor
- Built-in DTSS page system
- Large 1-7/16" speaker
- 41 E^2PROM channel memories (including 1 call channel)
- Multiple scan functions (VFO, call & memory)
- Carrier-operated & time-operated scan stop modes
- Tone alert with elapsed time indicator
- Battery-saver circuit and auto power-off function to extend battery life
- Selectable squelch configuration
- RF output power control (Hi/Low/EL)
- Built-in CTCSS encoder, optional TSU-8 decoder (any tone can be stored in any channel)
- User-friendly menu system to customize your operating preferences
- Easy to program and use
- Modifiable for MARS and CAP. Specifications guaranteed for Amateur bands only. Permits required for MARS and CAP use.
- Wide range of accessories to enhance operating convenience and enjoyment

Slim, compact, lightweight. These words describe the exterior of the new TH-22AT Series HTs. Rugged, innovative, sturdy. These words describe what is on the inside. Because along with the beauty, this new series of HT has all the things you want in a portable communications package. Like a streamlined, easy to program interface, one touch controls, and a simplified menu of functions that you can customize to suit your needs. Even a DTMF memory that stores five of your favorite 15 - digit telephone numbers for autopatch use. Wide band receive - 136 to 173.99 MHz. A new innovative microprocessor and final amplifier circuit enables a full five watts, while conserving battery power. (The supplied battery provides **3 watts**.) Easy mobile operation with optional PG-3H cable.

As always, a full line of accessories is available to enhance your operating enjoyment!

See your favorite Authorized Kenwood Amateur Radio Dealer for all the details!

Modifiable for MARS/CAP use.
Permits required. Specifications
guaranteed for Amateur band only.

93ARD-0829

KENWOOD COMMUNICATIONS CORPORATION
AMATEUR RADIO PRODUCTS GROUP
P.O. BOX 22745, 2201 East Dominguez St., Long Beach, CA 90801-5745
KENWOOD ELECTRONICS CANADA INC.
6070 Kestrel Road, Mississauga, Ontario L5T 1S8

KENWOOD